COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 29] March, 1959 [No. 3

DISEASES CAUSED BY BACTERIA AND FUNGI

STAMATIN, N., BICA POPII, V., RADUCANESCU, H. & CRISTESCU, P. (1958). La pathogénité pour le pigeon et le hamster, test de distinction entre les types humains et ovins de *Staphylococcus pyogenes*. **[Test for distinguishing human and ovine strains of *Staph. pyogenes*, based on pathogenicity for pigeon and hamster.]** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* p. 362. [In French.] **604**

Human and ovine strains differed in their haemolysins, behaviour on citrated meat extract medium and pathogenicity for sheep [see Stamatin & others, *Anu. Inst. Pat. Igien. anim.* **1**, 96 (1949)]. Strains from ovine mastitis were pathogenic for pigeons and hamsters: i/m inj. of 0·1–0·5 ml. of 24-hour broth culture killed pigeons 7–24 hours later; the same dose inj. i/p into hamsters was lethal after 5–24 hours. Strains from man and animals which did not coagulate meat extract were not pathogenic for pigeons or hamsters.—R.M.

PLASTRIDGE, W. N. (1958). **Bovine mastitis: a review.** — *J. Dairy Sci.* **41**, 1141-1181. [Author's summary modified.] **605**

The principal organisms associated with mastitis are *Streptococcus agalactiae, Str. uberis*, and *Staphylococcus pyogenes*. These usually cause chronic mastitis and a loss in milk yield with or without clinical symptoms. Mastitis due to other organisms is not common, but may be a problem in an occasional herd, especially following udder infusions improperly administered. When cultural tests are made on incubated milk, the leucocyte count must be used in interpreting the results, and when made on fresh milk, consideration must be given to the number and kinds of organisms present. *Str. agalactiae* can be eradicated by good sanitation with frequent cultural tests and treatment of all infected quarters.

The sanitary measures now in general use are inadequate to prevent new and re-infection with *Staph. pyogenes* and *Str. uberis*. Thus, treatment of infected quarters is of limited value.

Degree of exposure to infection, natural resistance of individuals, age, stage of lactation, and prolonged milking duration influence the rate of udder infections. Abusive machine milking, especially prolonged milking and use of worn or poorly designed teat cup liners, tends to increase the rate of clinical mastitis in infected quarters.

DHANDA, M. R. & CHANDRA SEKARIAH, P. (1958). **Studies on pneumococcosis in domestic animals. (1) Isolation of *Streptococcus pneumoniae* from pneumonic lungs of sheep and goats.**—*Indian vet. J.* **35**, 473-482. **606**

Str. pneumoniae was isolated from lesions of pneumonia in sheep and goats. Of 250 sheep and 150 goats 45% and 25% respectively were infected. Of 115 ovine strains of the organism examined serologically, 67 were Type 28; 18, Type 28A; and 30, Type 3. Of 38 caprine strains 29 were Type 3; 2 Type 28A; and 7 Type 28. —F.E.W.

MERGENHAGEN, S. E., THONARD, J. C. & SCHERP, H. W. (1958). **Studies on synergistic infections. I. Experimental infections with anaerobic streptococci.**—*J. infect. Dis.* **103**, 33-44. [Authors' summary modified.] **607**

The injection of from 10^8 to 10^9 anaerobic streptococci into the skin of rabbits produces a useful localized infection with which to study the pathogenicity of these organisms alone and in synergy with other bacteria. Infection with otherwise subeffective doses of washed anaerobic streptococcal cells (from 10^4 to 10^6) was made possible by including reducing agents (sodium thioglycolate, cysteine, or glutathione), agar or washed cells of *Staphylococcus aureus* in the inoculum. Furthermore, either *Staph. aureus* or cell-free filtrates of its broth cultures acted

synergically with anaerobic streptococci to produce a spreading necrotic lesion in rabbit skin. Present evidence indicates that staphylococcal hyaluronidase is one intermediary in this synergic process and that as yet unidentified heat-labile staphylococcal products participate also.

BARNES, E. M., SHARPE, M. E. & FEWINS, B. G. (1958). **The significance of faecal streptococci in meat and poultry.**—*Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* pp. 434-435. [Authors' abst. modified.] **608**

Surveys were made of the distribution of faecal streptococci in bacon factories and poultry plants. The possibility of differentiating between human faecal contamination and that of animal origin led to a re-examination of the types of faecal streptococci present in the faeces and their relative frequency. It was confirmed that *Streptococcus faecalis* and its variants *zymogenes* and *liquefaciens* are the commonest organisms in man, whilst very rare in meat animals, *e.g.* pigs and cattle. *Str. faecium* has a much wider distribution.

In view of the importance of *Str. faecium* in the spoilage of raw and heat-treated meat products, particularly canned hams, a detailed study was made of the serological types occurring in the intestines of pigs and in spoiled canned hams. Agglutination and precipitin tests show that the same serological types may occur in canned hams as in pig intestines, but the tendency among the strains examined so far is for the two groups to belong to separate types. One pig may harbour several different serological types, and a few types occur commonly in the intestines of pigs from quite different sources.

KOLESOV, S. G., KLEPTSOV, Y. S. & KALGANOVA, V. N. (1957). **[Anti-anthrax serum from oxen hyperimmunized with virulent cultures of anthrax bacilli.]**—*Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 209-210. [In Russian.] **609**

Oxen of the Red Steppe breed were inoculated s/c with killed 24-hour cultures of anthrax bacilli with alum, in increasing doses from 0·5 ml. to 350 ml. In the first experiment, serum from 5 of 11 oxen was inactive in neutralization tests on rabbits. In another experiment 12 oxen having active serum at the first test were tested again after 2 months: in 5 the serum was inactive. Nine oxen having inactive serum were inoculated again with the maximum dose of antigen: the sera remained inactive.—R.M.

BRODA, T., KRUCZEK, J. & LACH, H. (1958). Walka z gruźlicą bydła w województwie krakowskim. **[Control of tuberculosis in cattle in the Cracow district.]**—*Méd. vét., Varsovie* **14,** 270-272. [In Polish.] **610**

Tuberculin testing was carried out for 3 years in 2 counties; only adult cattle were examined. On the average 7·2 and 7·4% of animals gave a positive reaction and 62·3 and 76·7% of reactors were disposed of by the owners.

—M. GITTER.

ROBINSON, E. M. (1958). **Tuberculosis in pigs in South Africa.**—*J. S. Afr. vet. med. Ass.* **29,** 129-137. **611**

It was not possible by histopathological examination to differentiate tuberculous from corynebacterium infections in 200 specimens of lymph nodes from pigs thought to have tuberculous lesions. Bacteriological examination revealed acid-fast bacteria of varying morphology in 163 and a definite diagnosis of tuberculosis was made in 116 of these. Thirteen cases of *Corynebacterium equi* infection were demonstrated but all except two were associated with TB. Of the 76 tuberculous specimens typed, 57 were bovine and 19 human. Some reports have indicated that, in the majority of cases, TB. in pigs is limited to the lymph nodes of the head. In pigs experimentally infected with each of 3 types of tubercle bacillus, a limited infection could not be produced.—A. ACKROYD.

SMITH, H. WILLIAMS. (1958). **The source of avian tuberculosis in the pig.**—*Vet. Rec.* **70,** 586. **612**

Avian tubercle bacilli have been found in apparently healthy mesenteric lymph nodes of 5-7% of pigs, sheep, and cattle, whilst organs of 212 adult fowls yielded none. It seems possible that the domestic mammal rather than the fowl may be the source of avian tubercle infection in pigs.—A. ACKROYD.

ANDERSON, R. J. (1958). **The public health importance of animal tuberculosis.** —*Ann. N.Y. Acad. Sci.* **70,** 632-635. **613**

The author dismisses the risk of transmission of TB. from domestic pets to man as negligible and emphasizes that cattle are the main source of danger. In the U.S.A. from 1917 to 1952 many millions of cattle have been tested and reactors reduced, by disposal, from 5% to 0·11%. The danger of the "family" cow is pointed out and he states that although the control of TB. in cattle has undoubtedly reduced the incidence of non-pulmonary TB., especially in children, the improvement in nutrition and

general hygiene has also been of great importance. However, bovine TB. may be more widespread than imagined, and in obscure cases of abdominal disease tuberculin testing and investigation of the milk supply are advisable. A re-assessment of the importance of animal TB. is necessary.—W. K. DUNSCOMBE.

LITTLE, L. A. & DEVINE, J. M. (1958). **The effect of centrifugation on the cultivation of tubercle bacilli from sputum.** — *Mon. Bull. Minist. Hlth Publ. Hlth Lab. Serv.* **17,** 239-241. [Authors' summary modified.] **614**

Specimens of sputum were homogenized with 4% sodium hydroxide. Cultures were made from the uncentrifuged homogenized specimens and from the neutralized deposits.

Of 164 microscopically positive specimens, 160 yielded positive cultures; of these only one failed to grow from the uncentrifuged material. Of 104 cultures obtained from microscopically negative specimens, 30 failed to grow from the uncentrifuged material. On the other hand, 11 grew from the uncentrifuged material but not from the deposit after centrifugation.

HAAGEN, E. & HAAGEN-CRODEL, B. (1958). Über das Verhalten von Tuberkelbazillen in der Zellkultur. **[Behaviour of tubercle bacilli in tissue cultures.]**—*Zbl. Bakt. I.* (*Orig.*) **172,** 525-549. [Summaries in English, French and Spanish. English summary modified.] **615**

In tissue cultures tubercle bacilli behave like obligate cell parasites. It could not be observed whether they pass the cell membrane passively by phagocytosis or actively by functions of their own. None of the types of tubercle bacilli produce cytopathogenic effects in tissue cultures. The bacilli multiply in the cytoplasm only, never within the nucleus.

Tubercle bacilli are unable to enter some cell strains, especially HeLa cells, but remain on the surface of the cells, multiply, and do not adhere closely. Thus they can be washed away easily. All types of tubercle bacilli multiply best and most quickly within bovine tongue cells.

Tissue culture could possibly be used for the routine demonstration of tubercle bacilli.

PATERSON, A. B., WRIGHT, E. C. & PATTERSON, D. S. P. (1958). **Trace elements in the preparation of tuberculin.**—*Tubercle, Lond.* **39,** 275-282. [Authors' summary modified.] **616**

A mixture of inorganic salts based on the ash analysis of tubercle bacilli was found to improve the growth of *M. tuberculosis* var. *hominis* (Strains C, DT and PN) on synthetic media. Zinc alone at 6·25 p.p.m. produced all the effects of the complete salt mixture, but to a lesser extent. A combination of calcium, cobalt, copper and zinc salts was the best substitute for the complete mixture and on this basis the authors proposed a modification of Dorset's synthetic medium.

These trace element additives became necessary for synthetic media because purer constituents are now obtainable. This is especially true of glycerol and asparagine.

BURGISSER, H. (1958). Présence de mycobactéries dans deux cas de granulomes de Roeckl. **[Presence of mycobacteria in Roeckl's granuloma from two cows.]**—*Schweiz. Arch. Tierheilk.* **100,** 503-506. [Summaries in English, German and Italian.] **617**

Two cows reacted to tuberculin and were slaughtered, but no TB. lesions were found. Lesions in the flank of one cow and in the scapular region (and prescapular lymph node) of the other were described as "classical Roeckl's granuloma". [B. does not state how these lesions differed from so-called skin tuberculosis.] Acid-fast bacilli, resembling tubercle bacilli, were seen in histological sections of lesions. Inoculation of lab. animals gave negative results. —R.M.

KUJUMGIEV, I. [KUYUMDZHIEV, I.] (1957). Relazione tra il decorso dell'enterite paratubercolare dei bovini e la presenza di bacilli specifici nei gangli mesenterici. **[Presence of *Mycobact. johnei* in mesenteric lymph nodes of cattle with Johne's disease.]**—*Clin. vet., Milano* **80,** 370-371. **618**

Johne's bacillus was isolated from the mesenteric lymph nodes of 7 out of 22 infected cattle in Bulgaria. All 7 cases had recurrent diarrhoea and were emaciated.—R.M.

ANNAU, E. (1958). **A purified complement-fixing antigen from *Mycobacterium johnei*.**—*Nature, Lond.* **181,** 1206-1207. **619**

The antigen commonly used, a suspension of *M. johnei,* is not entirely satisfactory, first because it tends to fix complement non-specifically in cattle sera in which the globulins have become unstable during delay in transport; and secondly, because Johne's bacilli contain components common to other acid-fast organisms. The author gives details of a method of preparing a purified antigen which in a stock solution containing 3 mg./ml. of the fraction fixes complement in dilutions as high as 1:6,400 with sera of cattle naturally infected or immunized with Johne's bacilli. As an antigen for routine diagnostic tests it shows less tendency to pro-

duce non-specific reactions, but is still strongly reactive with antisera containing antibodies against avian tubercle bacilli.—E.V.L.

EDWARDS, D. C. (1958). **Production of high-titre diphtheria toxin in baffled shake flasks.** —*Nature, Lond.* **182,** 190-191. **620**

High-titre toxin can be produced in 48 hours in tanks containing 10 or 50 litres of medium stirred at 1,400 r.p.m., while shake flasks give relatively poor results. One-litre flasks fitted with single glass baffles and on a rotary shaker (140 r.p.m., ½ in. radius) produced toxin titres much higher than unbaffled flasks, often comparable with tank culture. Detergents added to the baffled shake flasks further improved toxin production. Probably, the detergent forms a layer of foam in the baffled flask, thus slightly reducing the uptake of oxygen; this would imply that it is possible to over-aerate cultures of *C. diphtheriae* when high-titre toxin is to be produced.—E.V.L.

TEZOK, F. (1958). **Three glanders strains isolated from three patients in 1956 and differing with regard to sensitivity to antibiotics.** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* pp. 344-345. [Author's abst. modified.] **621**

During the first half of 1956 three human cases of glanders were treated in Ankara. The diagnosis was confirmed by cultural and serological methods and by animal inoculation. All the patients recovered after supportive together with antibiotic therapy.

The first strain was remarkably sensitive to penicillin, tetracycline, oxytetracycline and chlortetracycline. The second strain was sensitive to chlortetracycline, oxytetracycline and streptomycin, whereas the third strain yielded to chlortetracycline, streptomycin and oxytetracycline, but not to penicillin.

ROWSELL, H. C. (1958). *Erysipelothrix rhusiopathiae* **infection in joints from market hogs in Canada.** — *J. Amer. vet. med. Ass.* **132,** 369-373. **622**

E. rhusiopathiae was isolated from 358 of 563 joints (63·5%) of arthritic market pigs, one joint only being removed from each carcass: a minimal incidence of 1% of pigs slaughtered. The carpal and stifle joints were most frequently submitted and the percentage of infection was highest in these. Calcification was observed more frequently in the joints of the front legs than those of the hind-legs. Active inflammatory changes were found in 433 of the joints, 330 of which yielded the organism. Fourteen yielded other micro-organisms.—A. ACKROYD.

RAY, J. D. (1958). **Present status of prophylactic vaccination in swine erysipelas.**—*J. Amer. vet. med. Ass.* **132,** 365-368. **623**

In the U.S.A., control of swine erysipelas has been attempted by the use of (1) autogenous killed vaccines, (2) swine erysipelas immune serum alone, (3) simultaneous vaccination with a virulent culture or (4) avirulent cultures. A recent questionnaire replied to by 220 veterinarians showed that method (1) is still the most commonly used, followed by (3), (4) and (2). Breaks following their use were reported by 60% of users for methods (1) and (4) and by 73% for method (3). In susceptible pigs, 5-8 weeks old, the most solid and lasting immunity is probably obtained with method (3). Methods (1) and (4) confer immunity for only about three months but the former is effective under more variable circumstances.—A. ACKROYD.

HAUPTMAN, B., JASIŃSKA, S., SOBIECH, T. & WACHNIK, Z. (1958). Listerioza świń. [**Listeria infection in swine.**] — *Méd. vét., Varsovie* **14,** 261-264. [In Polish. Summaries in English and Russian.] **624**

An account of the first reported outbreaks of *Erysipelothrix* (*Listeria*) *monocytogenes* infection in pigs in Poland. On one farm 172 out of 900 pigs of all ages died or had to be destroyed; on another, where only boars were kept, the number affected was not stated. Nervous symptoms and pyrexia were the main clinical manifestations and 2 sows aborted. In the first outbreak *E. monocytogenes* was recovered from the brain, spleen and liver of a pig submitted for laboratory examination. In the second outbreak diagnosis was by clinical symptoms, haematological examination and blood agglutination test which yielded a titre of 1:320. The authors are of the opinion that a titre of 1:80 can be regarded as positive.

—M. GITTER.

WINN, J. F., CHERRY, W. B. & KING, E. O. (1958). **Listeriosis: a potential public health problem.** — *Ann. N.Y. Acad. Sci.* **70,** 624-631. **625**

The extensive distribution of *E. monocytogenes* both in man and animals, is pointed out and also the difficulty of isolating the organism from fresh tissue. The main clinical manifestations in man, ruminants, and pigs are meningoencephalitis, septicaemia, and abortion, though in some human cases conjunctivitis, or a granulomatous condition has occurred. However in man septicaemia is probably the most common form and monocytes are not always present.

The tetracycline antibiotics are the drugs of

choice in treatment though penicillin and the sulphonamides are very useful too [and cheaper]. Vaccination in animals has not been a success and here direct contact seems to play a part in the spread of the disease. The epidemiology of the disease in man is scarcely known at all and the definite seasonal distribution which occurs in animals does not occur in man. The presence of somatic or flagellar agglutinins in a considerable proportion of healthy children indicates caution in assessment of infection. However the authors consider that listeriosis is a public health problem.—W. K. DUNSCOMBE.

GRAY, M. L. (1958). **Listeriosis in fowls — A review.**—*Avian Diseases* **2,** 296-314. [Author's summary modified.] **626**

The incidence of *Erysipelothrix* (*Listeria*) *monocytogenes* infection in fowls, the symptoms and the lesions are reviewed. In fowls there are no pathognomonic symptoms or lesions since the organism is often associated with some other disorder. Primary listeria infection is characterized most often by septicaemia with myocardial necrosis and/or focal hepatic necrosis. Occasionally a localized encephalitis with or without gross lesions is encountered. There is circumstantial evidence that birds may play a role in the transmission of the organism to other animals and man. Chick embryos may be of value for isolation of *E. monocytogenes* from suspected material. The use of feed containing antibiotics may have specific prophylactic value in birds.

Methods for isolating the organism and identifying cultures are also discussed.

MORRIS, E. J. (1958). **Selective media for some *Pasteurella* species.** — *J. gen. Microbiol.* **19,** 305-311. [Author's summary modified.] **627**

Three selective media are described for the isolation of *Past. pestis, septica, pseudotuberculosis* and *haemolytica* from material heavily contaminated with other bacteria.

SAKAZAKI, R. & NAMIOKA, S. (1958). **Serological typing of the klebsiella group.**—*Jap. J. exp. Med.* **28,** 85-93. [In English. Authors' summary modified.] **628**

Serological studies were performed on typical klebsiella cultures isolated from man, animals, eggs, and water. Of the 396 cultures, 77·8% were agglutinated by the 72 known capsular antigens, and the remainder could not be typed by these antigens. With a few exceptions, the cultures from man and animals did not differ essentially from each other. Capsular cultures from water also corresponded to those from man and animals.

REES, T. A. (1958). **Studies on *Escherichia coli* of animal origin. I. *E. coli* from natural outbreaks of colibacillosis of calves. II. *E. coli* from young lambs.**—*J. comp. Path.* **68,** 388-398 & 399-401. [Author's conclusions modified.] **629**

I. A survey of outbreaks of colibacillosis of calves is briefly reported and discussed with reference to epidemiology. The following serotypes were associated with these outbreaks: O9.A (type RVC118); O9.A (type RVC1798); O15.K?; O35.K?; O78.K80(B); O86.B7; O103.K (B)?; O117.K?; O137.K79(L).

Three serotypes, isolated from the udder secretions of cows with mastitis, were O9.A (type RVC1798); O24.K?; and O78.K80(B).

II. Three serotypes of *E. coli*, viz. O78, K80; O24, K?; and RVC3033 (antigens not yet determined), already known to be pathogenic for calves, are recorded from cases of disease of young lambs.

GORDON, W. A. M. & LUKE, D. (1958). **Gastro-enteritis in young piglets associated with *Escherichia coli*.**—*Vet. Rec.* **70,** 542-543. **630**

An acute scour in piglets occurring as early as 6 hours but usually a few days after birth is increasing in frequency in Northern Ireland. Mortality is heavy and survivors are often stunted and tailless. Lesions are those of gastro-enteritis. Pure cultures of a non-haemolytic *E. coli* are obtained. Drugs, strict attention to hygiene and disinfection have been ineffective in preventing outbreaks. Vaccination of sows (7–10 days before farrowing) with 2 doses of a vaccine prepared from the strain of *E. coli* isolated from actual casualties has provided the most promising means of control to date.

—A. ACKROYD.

PALYUSIK, M. (1958). Streptomycines-nátrium-tetrationátos dúsító eljárás a *B. suipestifer voldagsen*-nek sertésbélsárból való kitenyésztésére. **[Streptomycin–sodium tetrathionate enrichment process for isolation of *Salmonella typhi-suis* var. *voldagsen* from porcine faeces.]** —*Mag. állator. Lapja* **13,** 186-187. [In Hungarian.] **631**

Description of an enrichment process used for the isolation of *S. typhi-suis* var. *voldagsen* is given which has been used in the Veterinary Bacteriology Institute in Budapest for some time. 1 ml. of the suspended faecal sample is added to sodium tetrathionate solution containing 500-900 μg. streptomycin per ml. and poured on to the surface of nutrient agar containing pork-extract, lactose, peptone, sodium chloride, sodium hydroxide and bromthymol blue. After

incubation for 24 hours at 37°C., blue colonies of the *voldagsen* variant can be identified and subcultured. The question whether the same process is applicable in cases previously treated with antibiotics is still open.—A. SEBESTENY.

MANTHEI, C. A., AMERAULT, T. E. & GOODE, E. R. (1958). **Comparative efficacy of trypticase-soy and veal infusion broths for isolating *Brucella abortus* from the blood of cattle.**—*Bull. World Hlth Org.* **19**, 203. **632**

2,322 samples of blood were collected over a period of 27 weeks from 86 [? infected] cattle. Each sample consisted of 100 ml.: 50 ml. was placed in 150 ml. trypticase-soy broth and the other 50 ml. was placed in 150 ml. veal infusion. Of 353 isolations made from these samples 172 were in the trypticase medium and 181 in the veal broth: 47% of isolations were made simultaneously in both media. Analysis of the data revealed that bacteraemia was demonstrated in 31 cattle with both broths, in 8 cattle with veal broth only, and in 5 cattle with trypticase broth only.—R.M.

ZOUTENDYK, A. (1958). **Incomplete antibodies in brucellosis: an indirect antiglobulin (Coombs) one-tube screen test.**—*S. Afr. med. J.* **32**, 706-709. **633**

This one-tube screen test for the detection of incomplete brucella antibodies is a modified indirect antiglobulin (Coombs) technique using a heat-killed suspension of *Br. abortus* Strain 19 at opacity 4 as antigen, a serum dilution of 1/5, and two dilutions of anti-human globulin serum, usually 1/30 and 1/60. The entire test can be completed in a day. Positive reactions were obtained in 20·6% of 2,393 consecutive investigations of serum from suspected cases compared with 5% in a random population.

—A. ACKROYD.

JONES, L. M. & MORGAN, W. J. B. (1958). **A preliminary report on a selective medium for the culture of brucella, including fastidious types.**—*Bull. World Hlth Org.* **19**, 200-203. [Authors' conclusions.] **634**

Serum–dextrose agar with antibiotics gives promise of being more effective in isolating fastidious types of brucella from contaminated materials than previously employed media. The substitution of serum–dextrose nutrient agar base for albimi agar in antibiotic media permits better growth of *Br. abortus* type II and comparable growth of other types of brucella.

BABICH, M. A., PLOTNIKOVA, V. A. & LEVINA, I. G. (1957). **[Use of dried culture media for cultivation of brucella.]**—*Trud. nauchno-kontrol. Inst. vet. Preparatov* **7**, 57-62. [In Russian.] **635**

The authors studied dried media suitable for despatch to field stations which after reconstitution with distilled water could be used for the cultural diagnosis of brucellosis. One medium was composed of 5% dried agar medium (consisting of nutrient broth, agar, sodium chloride and sodium phosphate), 0·5% glucose and 2% glycerin. Another was prepared from 750 ml. potato extract, 250 ml. boiled "Hottinger base", 1% peptone, 0·5% sodium chloride, 0·5% glucose and 2% glycerin.—R.M.

TEPPER, B. S. & WILSON, J. B. (1958). **A comparison of the amino acid composition and nucleic acid content of strains of *Brucella abortus*.**—*J. infect. Dis.* **103**, 19-24. [Authors' summary modified.] **636**

The amino-acids of the protein of a virulent, CO_2-dependent strain and an essentially avirulent, CO_2-independent strain of *Br. abortus* were isolated and qualitatively and quantitatively compared. The composition of the protein of the two strains was identical.

The total nucleic acid, deoxypentose nucleic acid and pentose nucleic acid content of five strains of *Br. abortus* differing in their virulence and in their requirement for growth of partial pressures of CO_2 in excess of that in air were compared. There was a general similarity in nucleic acid content.

IVANOV, M. M. & ROMANOV, A. M. (1957). **[Immunization of sheep and cattle against brucellosis with Strain 19 vaccine.]** — *Trud. nauchno-kontrol. Inst. vet. Preparatov* **7**, 26-40. [In Russian.] **637**

An account of results achieved in the U.S.S.R. by the use of Strain 19 vaccine, including the results of serological tests on vaccinated animals.—R.M.

VAN DRIMMELEN, G. C. & STEYN, H. S. (1958). **The keeping quality of freeze-dried *Brucella abortus* strain 19 vaccine.**—*J. gen. Microbiol.* **19**, 324-329. [Author's summary.] **638**

Concentrated *Brucella abortus* strain 19 vaccine is shown to deteriorate in time, even at low temperatures (4–7°). The loss of viability of vaccine sealed in pure nitrogen can be expressed as a coefficient. The value of this coefficient may be derived from the formula of a straight line fitting the means of the logarithms of the viability counts made 1 week to 6 months after freeze-drying.

HAUG, E. (1958). Untersuchungen über die Keimzahl und den Dissoziationsgrad von flüssigen Abortus-Bang-Impfstoffen (Stamm Buck 19) bei verschiedenen Lagerungsbedingungen. **[Number of bacteria and extent of dissociation in liquid Strain 19 vaccine after storage.]**—*Inaug. Diss., Munich* pp. 34. **639**

Four batches of a proprietary Strain 19 vaccine were kept in a refrigerator or were carried about in a car and the degree of dissociation was determined at intervals for up to 8 weeks. Although the proportion of living organisms decreased more or less rapidly, there was no evidence of increased dissociation.—R.M.

ANON. (1958). **Joint FAO/WHO expert committee on brucellosis. Third report.** — *Tech. Rep. Wld. Hlth Org.* No. 148. pp. 51. 3s. 6d. [Also issued as F.A.O. Agric. Studies No. 45. Published in English, French and Spanish.] **640**

This is the third report of the joint WHO/FAO expert Committee on Brucellosis, and should be read in full by those interested. Only some points can be touched on in an abstract. **Epidemiology.** Reference is made to the transmission of the disease to man through infected cheese; the organism is frequently present in the urine of goats; the disease is more extensive among buffaloes than hitherto supposed; the hare apparently plays an important role in the epidemiology of the disease in pigs, and possibly sheep, in Europe; it has *apparently* (Committee's italics) become a major problem in pigs in some countries; reports have been received of infection in wild ruminants, rodents, birds, and insects, but there is no evidence so far that except the hare they play any important part in the epidemiology of the disease. **Diagnosis.** There is strong support for the milk ring test, though this is of limited application in buffaloes because of the high fat content, and for the stained antigen test as a screening test; *Br. melitensis* is almost always responsible for the disease in sheep; interpretation of tests should be on a herd basis. **Vaccines.** A statement is made on the efficacy of Strain 19 vaccine in 6 to 8-month-old calves: Two countries have produced evidence that a single injection of $6\text{-}8\text{x}10^{10}$ organisms gives immunity for 7 years, re-vaccination being unnecessary. The use of R strains for the vaccination of goats and sheep is mentioned and in goats an R strain of *Br. melitensis* seems to have proved satisfactory though agglutinins were not produced. Russia has found Strain 19 valuable against *Br. melitensis* infection in sheep. Dried vaccines require very careful testing and further studies on keeping quality are required. There is valuable emphasis on the advantages of an International Unitage system as regards anti-abortus serum, and a long annexe on the U.S.A. regulations concerning inter-State movements of cattle. There is no mention of recent work on anti-brucella phages, and the question of the identity of *Br. intermedia* has been passed to others.

—W. K. DUNSCOMBE.

VAN DRIMMELEN, G. C. (1958). **Vaccination against brucellosis in sheep and goats.** — *J. S. Afr. vet. med. Ass.* **29**, 15-19. **641**

Recent advances in the understanding of immunogenesis in brucellosis are discussed. Effective immunity depends on a long and intensive immunization process such as can be achieved by an infection of low virulence. In man and small stock, the Russian variant of the *Brucella abortus* Strain 19, designated "BA" and the Californian mutant strain of *Br. melitensis* have proved effective agents against *Br. melitensis* infections. In South Africa where *Br. melitensis* infections are prevalent in small stock in the thinly populated western areas, vaccination of sheep as well as calves with *Br. abortus* Strain 19 has shown promising results, but an avirulent strain of *Br. melitensis* designated var. *karakul* has recently been isolated and may be suitable as a vaccine organism for small stock.

—A. ACKROYD.

ELBERG, S. S. & MEYER, K. F. (1958). **Caprine immunization against brucellosis. A summary of experiments on the isolation, properties and behaviour of a vaccine strain.**—*Bull. World Hlth Org.* **19**, 711-724. **642**

A strain of *Br. melitensis* which was not dependent on streptomycin was derived from a streptomycin-dependent strain previously described [*V.B.* **27**, 2325]. After s/c inoculation of 1,500 million cells into goats, the organism was recovered from lymph nodes for up to 14 weeks. All 13 goats inoculated with living organisms, 2 of 12 inoculated with killed organisms and 2 of 12 unvaccinated controls resisted challenge with virulent *Br. melitensis* 4 months later. Vaccination was most effective if performed between 2 and 57 days before service. The authors also studied cross-immunity between tuberculosis and brucellosis, using monocytes from vaccinated rabbits.—R.M.

JONES, L. M., THOMSON, P. D. & ALTON, G. G. (1958). **Immunity against brucella infection in guinea pigs produced by three different vaccines.** — *J. comp. Path.* **68**, 416-427. [Authors' conclusions modified.] **643**

The immunity produced in g.pigs by a living avirulent *Br. melitensis* culture was greater than that produced by killed rough and smooth cultures in adjuvant. Challenge with four strains did not reveal significant differences in the protection afforded by the rough and smooth adjuvant vaccines.

JONES, L. M. (1958). **A recommended method for the preparation of mono-specific brucella sera.**—*Bull. World Hlth Org.* **19,** 177-186. **644**

An account of the method used at the Central Veterinary Laboratory, Weybridge. The importance of using entirely smooth cultures was emphasized. J. gave results of typing 180 brucella strains from various countries with the aid of mono-specific sera.—R.M.

BRUCE, W. & JONES, L. M. (1958). **The use of gel diffusion precipitin plates in the study of brucella.**—*Bull. World Hlth Org.* **19,** 187-196. [Authors' summary modified.] **645**

Cultures of *Br. melitensis* yielded a diffusible precipitin antigen which produced from 1 to 3 lines with sera of rabbits, goats and cattle that had been infected with either *Br. abortus* or *Br. melitensis*. A diffusible antigen could not be prepared from *Br. abortus* or *Br. suis* cultures. No precipitin reactions occurred with sera from cattle in brucella-free herds which had been inoculated with Strain 19 vaccine, although some of these sera were positive to the agglutination test.

MCCULLOUGH, N. B. & BEAL, G. A. (1958). **The biological stability of the genus *Brucella*.** — *Bull. World Hlth Org.* **19,** 725-737. [Authors' synopsis modified.] **646**

The constancy of the three species of brucella is discussed with regard to the historical background and current research. The authors maintain that members of the genus are not labile, nor subject to spontaneous species alteration. [See also *V.B.* **28,** 2052.]

BURDIN, M. L., FROYD, G. & ASHFORD, W. A. (1958). **Leptospirosis in Kenya due to *Leptospira grippotyphosa*.**—*Vet. Rec.* **70,** 830-835. [Authors' summary modified.] **647**

An account of an outbreak in cattle, sheep, and goats. Symptoms and lesions are described. An account is given of the laboratory methods of diagnosis and isolation of the organism. There was a high incidence of mild cases in which renal lesions were the sole manifestation of the disease; their possible importance as carriers is stressed.

NORVAL, J. (1958). **Leptospirosis in pigs.**—*Vet. Rec.* **70,** 470-472 & 484. **648**

Leptospira pomona has been found in pigs in many parts of the world but not in Great Britain, although recently blood agglutination titres of 1/30 against this species have been found in pigs in Edinburgh. Whilst it has been isolated from the striped field mouse, pigs are considered the main carrier host. *L. pomona* infection is widespread in cattle in the U.S.A. and is responsible for Swineherd's fever in man. *L. mitis* has been recovered from pigs but causes a very benign leptospirosis. *L. icterohaemorrhagiae* has been isolated in outbreaks of jaundice in young pigs in several European countries including Gt. Britain. It was found to be endemic in pigs in Western Samoa following an outbreak of Weil's disease in man. Although dogs are considered the primary host of *L. canicola,* a serological survey of pigs in Edinburgh has shown that they are heavily infected with this serotype. It does not give rise to serious illness in pigs or man. Human cases that have occurred in Edinburgh have been largely associated with piggeries.

—A. ACKROYD.

BROOM, J. C. (1958). **Leptospiral infection rates of wild rats in Britain.**—*J. Hyg., Camb.* **56,** 371-376. [Author's summary modified.] **649**

Kidneys of 850 *Rattus norvegicus* had an infection rate of 43% with leptospires, assumed to be *L. icterohaemorrhagiae*. Infection rates were the same for rural, urban and sewer rats with some local differences. An unusual finding was a 35% infection rate among young rats.

In a similar survey on *R. rattus,* only 2 of 88 caught in London were positive, compared with 31 of 35 killed in other towns. Of 98 *R. rattus* killed during fumigation of ocean-going steamers, 69 were infected.

SHARP, C. F. (1958). **Laboratory diagnosis of leptospirosis with the sensitised-erythrocyte lysis test.** — *J. Path. Bact.* **76,** 349-356. [Author's summary modified.] **650**

An erythrocyte-sensitizing substance prepared from *L. australis A* (Strain Ballico) reacted with antibody against 26 pathogenic serotypes of leptospira and the non-pathogenic serotype *L. biflexa*.

A rising titre of erythrocyte-sensitizing substance (E.S.S.) antibody was detected by the sensitized erythrocyte lysis test in 104 patients with proven leptospiral infection.

The test on paired sera appears to be of value in the diagnosis of leptospirosis, particularly when an epidemic necessitates the examination of large numbers of patients. The test may also aid in distinguishing active from

anamnestic agglutination-lysis reactions, but its value as a means of surveying populations for past leptospiral infection is doubtful.

PERRY, K. D., NEWLAND, L. G. M. & BRIGGS, C. A. E. (1958). **Group-D rumen streptococci with type antigens of group N.** — *J. Path. Bact.* **76,** 589-590. [Authors' summary modified.] **651**

Of 37 strains of Group-D streptococci isolated from the rumen of young calves, ten *Str. bovis* and one unidentified strain shared a type antigen with Group N; one *Str. bovis* and two unidentified strains shared type antigens with Groups E and N.

SHIRLEY, G. N. (1958). **Clostridial enteritis in cattle.**—*Vet. Rec.* **70,** 478-480. **652**

In Cheshire, isolated cases of a disease usually manifested by sudden death have been occurring for some years in cattle, generally shortly after calving. In less acute cases, it resembles milk fever but the temperature is high. P.M. appearances are of an acute enteritis. The condition has been shown to be caused by the toxin of *Clostridium welchii* Type A. The incidence is now becoming serious, multiple infection has been observed, and there is a suspicion that the disease is spreading to pigs.—

—A. ACKROYD.

MCGOWAN, B., MOULTON, J. E. & ROOD, S. E. (1958). **Lamb losses associated with *Clostridium perfringens* Type A.** — *J. Amer. vet. med. Ass.* **133,** 219-221. **653**

In California, a series of deaths have been encountered in young thrifty unweaned lambs, uncastrated undocked rams, wether and ewe lambs all being affected. Bacteriological and experimental findings have indicated that they are associated with *Cl. welchii* Type A infection. Some lambs have been found dead whilst others have first shown lassitude, increased respiration, pale icteric conjunctivae and haemoglobinuria and died in 6–12 hours. The P.M. findings and the histology of the lesions, which are described, resemble closely those of the enterotoxaemic jaundice of adult sheep described in 1936 in Australia.—A. ACKROYD.

KAWATOMARI, T. (1958). **Studies of the L-forms of *Clostridium perfringens*. I. Relationship of colony morphology and reversibility.** — *J. Bact.* **76,** 227-232. [Author's summary modified.] **654**

Six strains of *Clostridium perfringens* [*Cl. welchii*] Types A, B, C, D, E, and F were converted to L-forms with the aid of penicillin plate cultures. A reversion of the L-forms to their respective bacterial forms was not observed on plate cultures without penicillin. The L-forms reverted to bacterial forms in fluid media. Three types of mature L-colonies of *Cl. perfringens* were described. The L-forms were practically non-toxic for g.pigs and rabbits.

LAURENCE, D. R. & WEBSTER, R. A. (1958). **The activity of a variety of chemical compounds against experimental tetanus.**—*Brit. J. Pharmacol.* **13,** 334-338. [Authors' abst. modified.] **655**

Chemical compounds, mostly with central nervous system depressant activity, were tested against tetanus in rabbits. Phenothiazine derivatives were the most potent anticonvulsants and of these acetylpromazine had the greatest activity.

KAGAN, F. I. & KOLESOVA, A. I. (1957). **[Results of trials with polyvalent concentrated aluminium hydroxide vaccine against braxy, ovine enterotoxaemia and lamb dysentery.]**—*Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 217-224. [In Russian.] **656**

Seven batches of the polyvalent vaccine were prepared and were tested on rabbits and sheep. Sheep were inoculated i/m with 2 ml. and again after 25 days with 3 ml. Four months after vaccination, 2 of 2 sheep resisted challenge with *Cl. welchii* Type C, 2 of 2 with *Cl. septicum* and 1 of 2 with *Cl. oedematiens*. The vaccine was tried on 1,425 sheep in a group of 20,000, in which bivalent formol-alum vaccine against lamb dysentery and enterotoxaemia had failed to control losses during the previous year: *Cl. septicum, oedematiens, welchii* and *bifermentans* had been isolated from dead sheep. Only 0·1% of the sheep died, compared with 2·8% of sheep inoculated with bivalent vaccine. During the next year *Cl. bifermentans* was added to the polyvalent vaccine and 21,000 adult sheep and 8,500 lambs aged 2–3 months were vaccinated, but the results are not given.

—R.M.

SIMON, J. & MCCOY, E. (1958). **Bovine mastitis attributed to bacteroides species.** — *J. Amer. vet. med. Ass.* **133,** 165-168. **657**

In a herd of 43 cows producing abnormal milk and yet having a milk bacterial count of only 30,000 per ml., an encapsulated rod-shaped organism, eventually identified as a *Bacteroides* sp., probably *B. funduliformis* [*Fusiformis necrophorus*], was isolated from 36 of the 97 infected quarters. The other pathogen isolated was a Group B streptococcus. *In vitro,* the

unencapsulated organism was sensitive to various antibiotics, but therapy with various combinations was ineffective. The gross and histopathological changes in the udder and supramammary lymph node attributed to this organism are described.—A. Ackroyd.

Kaushal, R. L. & Kangude, G. M. (1957). **Studies on a combined vaccine against haemorrhagic septicaemia and black quarter. Part III—A simplified medium for the mixed cultivation of Pasteurella bovisepticus, Cl. septicum and Cl. chauvoei.** — *J. vet. Res., Mhow* **2**, 1-4. [Authors' summary modified.] **658**

The authors described a medium containing acid digest of ground-nut cake, spinach juice, liver extract and cystein hydrochloride for the cultivation of *Pasteurella septica, Clostridium septicum* and *Cl. chauvoei*. The ground-nut cake hydrolysate (acid) supported growth of these three organisms and spinach juice stimulated it. This medium was more efficient and cheaper than conventional media.

Harper, G. J., Hood, A. M. & Morton, J. D. (1958). **Airborne micro-organisms : a technique for studying their survival.**—*J. Hyg., Camb.* **56**, 364-370. [Authors' summary modified.] **659**

The concentration of viable cells in an aerosol of micro-organisms is reduced by physical loss and biological decay. The preferred way of distinguishing between the two processes is to mix the test aerosol with a tracer which is subject only to physical loss. Tracers for bacterial clouds are bacteria grown on a medium containing radiophosphorus and killed by formaldehyde and washed. The tracer should be of the same species as the cells under test.

I. Darmady, E. M., Hughes, K. E. A. & Jones, J. D. (1958). **Thermal death-time of spores in dry heat in relation to sterilisation of instruments and syringes.** — *Lancet* October 11th, 766-769. **660**

II. Darmady, E. M., Hughes, K. E. A., Jones, J. & Tuke, W. (1958). **Sterilisation by conducted heat.**—*Ibid.* 769-770. [Authors' summaries modified.] **661**

I. In 1,472 experiments the thermal death-times of *Clostridium tetani*, dried spore-bearing soil, and *Bacillus stearothermophilus* were determined at temperatures from 150° to 190°C. A thermostatically controlled aluminium block, with accuracy of ± 1°C., was used as a heat source, with thermocouples to ascertain the temperatures. The results, plotted on semilogarithmic paper, were essentially linear. They agreed with those reported for other spores, though in some a correction factor had to be applied to allow for the time taken by the test article to reach the sterilizing temperatures.

New standards for sterilization by dry heat are proposed. The safety margin will be adequate if the articles are kept at the sterilizing temp. for 1½ times as long as is necessary to kill all spores of *Cl. tetani* at a temp. 10°C. lower. For routine use, Browne's tube III gives an adequate guide to safety except perhaps at temperatures above 170°C.

II. For the small user a thermostatically controlled aluminium block, with holes which take syringes in their containers, is a reliable means of sterilization. Cutting instruments can be sterilized by laying them in a covered tray placed on top of the block. With a block maintained at 190°C., syringes should be heated for 18 min. and instruments for 30. If the block is started from cold, syringes need 30 min. and instruments 45.

Cunningham, I. J. (1958). **Non-toxicity to animals of ryegrass endophyte and other endophytic fungi of New Zealand grasses.**—*N. Z. J. agric. Res.* **1**, 489-497. **662**

Between 1939 and 1942 several species of endophytic fungi were described in New Zealand in association with perennial rye-grass and other grasses. Since it is commonly the practice to assume a fungus to be pathogenic until the contrary is proved, C. fed these fungi and seed infected with them to sparrows, fowls, mice, rats, sheep and cows for evidence of toxicity. No such evidence was obtained. It is of interest that, contrary to common belief, darnel was not found to be harmful to sheep fed with imported hulled oats containing 4·6% of the seed which was infected with the darnel endophyte.

—E. G. White.

Chick, E. W., Evans, J. & Baker, R. D. (1958). **Treatment of experimental mucormycosis (*Rhizopus oryzae* infection) in rabbits with amphotericin B.** — *Antibiot. & Chemother.* **8**, 394-399. [Summary in Spanish p. 434.] [Authors' summary modified.] **663**

Lesions were virtually absent in rabbits inoculated i/v with *Rhizopus* spores and treated i/v with amphotericin B, although a foreign-body reaction occurred about injected non-proliferating spores in the lungs. In untreated controls, i/v inoculation of *Rhizopus* spores produced foci of proliferating hyphae in many organs with neutrophilic response to the fungus, and prominent renal abscesses.

Amphotericin B protected a rabbit against a lethal dose of *Rhizopus* spores.

CHICK, E. W., EVANS, J. & BAKER, R. D. (1958). **The inhibitory effect of amphotericin B on localized *Rhizopus oryzae* infection (mucormycosis) utilizing the pneumoderma pouch of the rat.**—*Antibiot. & Chemother.* **8,** 506-510. [Summary in Spanish p. 540. Authors' summary modified.] **664**

Amphotericin B inhibited the development of hyphae from spores of *Rhizopus oryzae* when introduced into the pneumoderma pouch of a rat. [Pouches were created by the technique of Selye, 1953 (*Proc. Soc. exp. Biol., N.Y.* **82,** 328)]. The histological pattern, characterized by accumulation of macrophages, leucocytes, and giant cells with prominent tubercle formation and scar tissue, was essentially the same in untreated and treated rats.

Amphotericin B appears promising as a therapeutic agent in the treatment of mucormycosis in man.

The pneumoderma pouch of the rat affords an additional method for testing the effect of drugs on infectious disease agents.

BALBIERZ, H., KUPROWSKI, M. & SIELICKA, B. (1958). Wyosobnienie zjadliwego szczepu *Candida albicans* w enzootii norek. **[Isolation of *Candida albicans* from mink.]**—*Méd. vét., Varsovie* **14,** 264-270. [In Polish. Summaries in English and Russian.] **665**

An account of an outbreak in which 6 of 48 mink died. Bacteriological and histological examinations were carried out on only one carcass. Lancefield Group "A" streptococci and *Candida albicans* were recovered from internal organs in which the yeast cells were demonstrated on histological examination.

—M. GITTER.

FLAMM, H., KOVAC, W. & KUNZ, C. (1958). Experimentelle Pilzinfektion der weissen Maus während der Gravidität. **[Experimental fungal infection of pregnant mice.]** — *Zbl. Bakt. I. (Orig.)* **172,** 449-457. [Summaries in English, French, Spanish and Russian. English summary modified.] **666**

In pregnant mice infected i/v with *Candida albicans,* the fungus was demonstrated not only in the internal organs but also in the placenta in many cases. Here it multiplied only in the basal and marginal decidua and in the chorion with the exception of the villi. After multiplying within the membranes the fungus gained access to the amniotic fluid, and eventually the embryo. The severe placental lesions caused the death of the foetus before foetal lesions developed and, though the blood of the dam contained the fungus, that of the foetus did not.

MANTEN, A. & HOOGERHEIDE, J. C. (1958). **The influence of a new antifungal antibiotic, pimaricin, on the yeast flora of the gastrointestinal tract of rats and mice during tetracycline administration.** — *Antibiot. & Chemother.* **8,** 381-386. [Summary in Spanish p. 433.] [Authors' summary modified.] **667**

The normal yeast flora of the intestinal tract of rats and mice could be increased after 24 hours to many times its original value by incorporating tetracycline, 200 p.p.m., in their food. Addition of pimaricin, 50 p.p.m., or more, to the tetracycline-supplemented feed prevented any yeast accumulation or, when already established, reduced the yeast count to practically zero. After termination of pimaricin feeding, the intestinal tract of many rats remained free from yeasts for an extended period, notwithstanding continued tetracycline feeding.

PARFENTJEV, I. A. (1958). **Yeast antibiotic with therapeutic and prophylactic properties.**—*J. infect. Dis.* **103,** 1-5. [Author's summary modified.] **668**

A complex yeast fraction of low toxicity was described possessing a wide range of antibiotic activity *in vivo.* It protected animals against many species of Gram-negative and Gram-positive bacteria, *Candida albicans,* and shigella endotoxin. It can be injected by different routes and sterilized the blood of animals with septicaemia. Upon injection it induced in mice resistance to proteus infection which lasted one month.

JELLISON, W. L. (1958). **Haplomycosis in Japan and Africa.** — *Mycologia* **50,** 580-583. **669**

Since the first report on *Haplosporangium parvum* infection of small mammals in Arizona by Emmons & Ashburn [*V.B.* **14,** 318], it has been reported in Canada, England, Korea and Norway. J. has now isolated the fungus from two species of rodents from Japan and from a rodent and a carnivore from East Africa.—R.M.

CATANEI, A. & SCHOUSBÖE, A. (1958). **Sur des souches algériennes de champignons à culture faviforme isolées de teignes humaines et animales. [Trichophyton infection in man and animals in Algeria.]**—*Arch. Inst. Pasteur Algér.* **36,** 6-11. **670**

This is largely a review of the work of the authors over many years on strains of *Tricho-*

phyton isolated from man and animals in Algeria. The cultural characters of the parasite isolated from man, calves and sheep are discussed and the view of Georg that *T. discoides*, *T. album* and *T. ochraceum* are merely cultural types of the same species, *T. verrucosum*, is supported. This species is the cause of all the cases of ringworm encountered in Algeria in man and livestock. Observations during recent years at the clinic for venereal diseases in Algeria have revealed a fair number of cases of ringworm, some of them severe and persistent.

—E. G. White.

Heyn, W. (1958). Hautmykose bei einem Rinderfetus. **[Dermal mycosis in an aborted calf.]**—*Dtsch. tierärztl. Wschr.* **65**, 561-563. [Summary in English.] **671**

The Veterinary School in Hanover received from Coblenz a portion of skin, fixed in formalin, from a six-month-old foetus aborted by a first-calving heifer. The foetus showed widely disseminated circular skin lesions like those of ringworm. The portion of skin showed a purulent and necrotizing dermatitis with numerous branching fungal hyphae but no fructification organs. Cultural examination was not possible. There is a photograph of the foetus. It is suggested that the fungus may have been *Oospora lactis*, because it is surmised that this fungus may have been the cause of "tail eczema" in the herd six months previously and that the organism may have entered the uterus from the external genital organs. Two previous records of skin lesions in bovine foetuses caused by fungi are quoted from the literature.

—E. G. White.

I. Suleimanova, Z. Z. (1957). **[Technique of preparing pleuropneumonia antigen.]**—*Trud. nauchno-kontrol. Inst. vet. Preparatov* **7**, 262-265. [In Russian.] **672**

II. Suleimanova, Z. Z. (1957). **[Storage life of pleuropneumonia antigen.]**—*Ibid.* **7**, 266-267. [In Russian.] **673**

I. Between 1940 and 1954, 703 litres of lymph were collected from 770 cattle with contagious pleuropneumonia, but only 130 litres contained complement-fixing antibodies and was suitable for use in the complement-fixation test. Some of the lymph regarded as unsuitable was phenolized and stored. After storage for from 3 months to 2 years a deposit formed which in most cases possessed sufficient complement-fixing antigen for use in the c.f. test. Lymph from an infected ox was separated into albumin, euglobulin, pseudoglobulin and polysaccharides: only the pseudoglobulin possessed complement-fixing activity.

II. Titre and specificity of bovine contagious pleuropneumonia antigen was retained after 10 years' storage at room temp. (at from 2° to 35°C.) in some specimens. In other specimens there was a fall in titre after 2 or 3 years, but no further decrease occurred during a further 4 years. Antigen prepared from lymph deposit retained its activity for more than 10 years.—R.M.

Hammar, A. H., Gingher, P. E., Price, R. J. & Markham, F. S. (1958). **The use of the serum spot plate test for avian PPLO.**—*Avian Diseases* **2**, 213-226. [Authors' summary modified.] **674**

Use of the serum plate tests for avian pleuropneumonia-like organisms is described. Detailed serological data from field experiments on individual hens and their chicks are given in reference to the sensitivity and specificity of the serum plate test, contact transmission from asymptomatic birds, and passive antibody transfer from hen to chick.

The authors found the serum plate test relatively simple, rapid, sensitive and specific. Its use is indicated in attempts to obtain PPLO free breeder flocks.

See also abstr. **908** (report, Union of South Africa); **909** (report, Nigeria).

DISEASES CAUSED BY PROTOZOAN PARASITES

Nigeria. (1957). **West African Institute for Trypanosomiasis Research. Annual Report 1957.** [Nash, T. A. M.] pp. 59. London: Harrison and Sons Ltd. **675**

Work on (a) **Human trypanosomiasis** included investigation of factors governing the infection of *G. palpalis* with *T. gambiense*. Flies which fed immediately after emergence were more readily infected than if they fed when they were older. During an investigation of the behaviour of *T. rhodesiense* and *T. gambiense* in man under experimental conditions metacyclic forms of *T. rhodesiense* developed and multiplied in the subcutaneous tissues. In monkeys both *T. gambiense* and *T. rhodesiense* showed a periodic fluctuation in numbers. Ordinarily it is only the long-slender forms that divide but, before the peak in total numbers is reached, the stumpy forms start to increase rapidly and reach the highest proportion during

the time when the total population decreases. It is suggested that at the end of an increase in total population during each cycle, the long-slender dividing forms change by shrinkage (possibly as a result of the defence-mechanism of the mammalian host) through the intermediate stage into the stumpy forms which are more resistant. These later elongate and finally become actively dividing long-slender forms again. *In vitro,* under certain circumstances, human plasma could induce long-slender forms of *T. rhodesiense* to shrink into stumpy forms. Field trials with pentamidine indicated that over 20% relapses might occur. Berenil appeared to produce more permanent cure.

(b) **Animal trypanosomiasis.** Great difficulty has normally attended attempts to maintain *T. congolense* at Vom because of the lack of persistence in the laboratory animals used. A strain recently isolated has, however, proved so virulent for dogs and rats that it has been provisionally called *T. dimorphon* [—this is usually regarded as a synonym for *T. congolense*]. The parasite has been cyclically transmitted by *G. morsitans* and some observations on its infectivity to several species of animals have been completed. During the course of immunity studies on various breeds of cattle and on game animals the relationship with antibody level was observed using a respiratory test (the suppressive effect of a serum on the oxygen consumption of a rat-adapted strain of *T. vivax*). Three types of disease are recognized—acute, chronic, and the transient infection which occurs in hyper-immune animals and, under certain conditions, in Muturu [Nigerian Shorthorn] and N'Dama cattle. A young reedbuck (*Redunca redunca*) after exposure on two occasions to large numbers of *G. palpalis* infected with *T. vivax* did not respond, in that no trypanosomes were seen in the blood and no antibody was produced. There were, however, striking changes in the serum-protein pattern. Investigations into chemotherapy and prophylaxis included the observation that ethidium bromide was effective against *T. vivax* in the horse at a concentration of 1 mg./kg. intramuscularly as a 2% solution. Further work has established that suramin complexes can give protection for over a year. The ethidium–suramin combination had appeared to give the most lasting effect but severe local reactions were experienced and many animals lost the drug depot. Breakdown in protection, usually with the reappearance of *T. congolense,* followed in 34-86 days. Possible causes of these violent reactions were investigated: ethidium chloride was sometimes substituted for ethidium bromide, the volume of the inoculum was reduced and the i/m route of injection was tried. Use of i/m inj. initially seemed more successful but appeared to lead to generalized toxicity and to a reduction in the duration of prophylaxis. Work on (c) **The insect vectors** is reported from the Ugbobigha Field Station (Southern Nigeria) and from Kaduna (Northern Nigeria).

—S. Brian Kendall.

Bauer, F. (1958). Über den Wirkungsmechanismus des Berenil (4,4'-Diamidino-diazoaminobenzol) bei *Trypanosoma congolense.* **[Mode of action of "Berenil" on** *T. congolense.***]**—*Zbl. Bakt. I.* (*Orig.*) **172,** 605-620. [Summaries in English, French and Spanish. English summary modified.] **676**

Numerous *in vivo* and *in vitro* tests proved that "Berenil" has a direct action on *T. congolense*. Within a short time therapeutic amounts of the drug are bound irreversibly by the trypanosomes, but several hours elapse before the parasites succumb. The lethal doses are about the same in animal experiments as *in vitro*. The biological defence mechanisms of the host, however, support the drug action.

Abdel-Latif, K. (1957). **The incidence of diseases caused by intercorpuscular blood parasites in camels in Egypt.**—*Vet. med. J., Giza* **4,** No. 4 pp. 43-54. [Author's summary modified.] **677**

The incidence of trypanosome and microfilaria infections in camels in Egypt was determined.

The percentage of trypanosome infection in 73 Police camels, 125 native and 379 Sudanese camels was 41%, 2·4% and 4·7% respectively as diagnosed by examination of blood smears, and 67·1%, 34·4% and 37·2% respectively by mercuric chloride and formol gel tests.

The percentage of microfilaria infection in Police camels, native and Sudanese camels was 4·1%, 4% and 1·3% respectively and was relatively higher in males than in females. It was 1·6% in camels over 7½ years, 0·6% in middle-aged ones and 0% in young camels under 4½ years.

Mahmoud, A. H. & Abdel-Latif, K. A. (1957). **Treatment of camel trypanosomiasis with suramin, Antimosan and their combination.** —*Vet. med. J., Giza* **4,** No. 4 pp. 109-122. [Authors' summary modified.] **678**

In the treatment of camel trypanosomiasis best results were obtained by maximum safe doses of trypanocidal drugs.

Suramin as a single dose of 5 g. (about 14 g./kg. body wt.) produced 100% cure. Smaller

doses failed to cure some cases in which trypanosomes quickly became drug-fast and in such cases renewed treatment with the same drug had no effect. Smaller prophylactic doses should therefore be raised to maximum therapeutic doses to avoid drug-fastness.

Stibophen (Antimosan 6·3% solution) in 2-3 doses of 40 ml. each is not effective in the treatment of camel trypanosomiasis.

Stibophen seems to assist suramin in trypanocidal activity. Suramin in a single dose of 4 g. dissolved in 40 ml. of stibophen gave 100% cure and better curative results than suramin alone, but this treatment is expensive.

ORMEROD, W. E. (1958). **A comparative study of cytoplasmic inclusions (volutin granules) in different species of trypanosomes.**—*J. gen. Microbiol.* **19,** 271-288. [Author's summary modified.] **679**

The literature on 'volutin' granules is reviewed in an attempt to clarify the meaning of the term with regard to trypanosomes. 15 species of trypanosomes were examined by phase-contrast microscopy and the morphology and natural history of their cytoplasmic inclusions described. It is suggested that the formation of inclusions in trypanosomes circulating in the blood of mammals is a constant phenomenon closely related in time to the immune reaction of the host; other evidence suggests that this relationship is not fortuitous. In addition, the formation of inclusions in *Trypanosoma rhodesiense* and *T. lewisi* appears to be related to polymorphism, notwithstanding the wide differences in the manner and time in which polymorphism (and associated cytoplasmic inclusions) occur within their cycles in the vertebrate host.

AINLEY, A. D. & DAVEY, D. G. (1958). **The trypanocidal activity of some pyrimidylaminophenylarsonic compounds.**—*Brit. J. Pharmacol.* **13,** 244-249. [Authors' abst.] **680**

A series of substituted pyrimidylaminophenylarsonic acids have been prepared, reduced to the corresponding oxophenylarsines and finally, in certain cases, to the arsenobenzenes. The tervalent arsenicals were highly active against *Trypanosoma rhodesiense* in mice. 4-(2:6 - Diaminopyrimid - 4 - ylamino) phenyloxoarsine either as the insoluble carbonate or the soluble isethionate was the most promising of these compounds.

STAUBER, L. A. (1958). **Host resistance to the Khartoum strain of *Leishmania donovani*.**—*Rice Inst. Pamphl.* **45,** 80-96. [Author's summary modified.] **681**

A range of resistance to *L. donovani* has been found within the animal species studied. It extends from the complete susceptibility of the hamster which eventually succumbs to the intracardial introduction of a single parasite, to the innate resistance of the rat and rabbit which soon dispose of as many as several million parasites.

The chinchilla and cotton rat are highly susceptible. The chinchilla dies from the infection, but the cotton rat is able to bear an enormous burden of parasites with no apparent ill effects.

In terms of acquired resistance, the mouse, gerbil and g.pig are the most interesting species because each is susceptible enough to permit some increase in parasites for a number of days after inoculation, but each later checks this increase. The mouse apparently does not successfully eliminate the leishmania from its body, the parasite density remaining above the threshold of patency for many days.

The gerbil and the g.pig do effect virtual removal of the parasites; the g.pig accomplishes this result in about one-fourth the time that the gerbil requires.

After superinfection the hamster and chinchilla show no detectable increase in resistance resulting from the prior infection. The gerbil, however, shows a measurably heightened resistance to a second infection.

LEVINE, N. D., MIZELL, M. & HOULAHAN, D. A. (1958). **Factors affecting the protective action of glycerol on *Trichomonas foetus* at freezing temperatures.**—*Exp. Parasit.* **7,** 236-248. **682**

The authors studied the action of antimetabolites, lecithin and sodium chloride on the survival of trichomonads frozen to minus 21°C. in the presence of glycerol. Increase of sodium chloride conc. in the medium decreased survival rate of the protozoa, while increase of glycerol conc. up to the toxic limit of 1·6 M increased survival. These findings supported the theory that the protective action of glycerol is due to its salt buffering action.—R.M.

PELLÉRDY, L. & MIKLOVICH, N. (1958). **Studies on the mechanism of the coccidiostatic activity of certain sulphonamides. II. The synergistic action of some antimalarial drugs with sulphonamides.**—*Acta vet. hung.* **8,** 69-75. [In English.] **683**

"Daraprim" (pyrimethamine) or "Plasin" (chlorguanide) together with "Ultraseptyl" [described by the authors as 2 sulphanilamido-4-methyl thiazole, but in fact probably the sodium salt], "Superseptyl" [described as 2

sulphanilamido-4,6-dimethyl pirimidine (*i.e.* sulphadimidine), but in fact possibly sodium sulphathiazole] or sulphaquinoxaline, showed a coccidiostatic effect against *Eimeria stiedae* in the rabbit.—S. Brian Kendall.

McLoughlin, D. K., Rubin, R. & Cordray, D. R. (1958). **Further studies on the development of immunity to cecal coccidiosis in the presence of nicarbazin.**—*Poult. Sci.* **37,** 813-816. **684**

Nicarbazin did not markedly interfere with the development of resistance to re-infection with *Eimeria tenella,* as assessed by a challenge inoculum which killed about 16% of birds believed to have been previously uninfected.
—S. Brian Kendall.

Kartashev, M. V. (1957). [**Incidence of infection of *Dermacentor* ticks with *Babesia caballi* in the central zone of the U.S.S.R.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 210-220. [In Russian. Summary in French.] **685**

Clavate forms of piroplasms were identified in smears of eggs of from 3 to 35% (average 3·9%) of *D. pictus* and *D. marginatus* collected from farms infected with equine piroplasmosis. The proportion of ticks infected in areas where the disease was endemic was higher than that in epidemic areas. For diagnosis, 200 microscopic fields in each of 3 smears of eggs, collected after 5–6 days of incubation, should be examined. Examination of salivary gland smears was less reliable. The method could be used to determine the epidemiological status of a district.—R.M.

Tsaprun, A. A. (1957). [**Development of *Babesia caballi* in *Dermacentor* ticks.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 221-240. [In Russian. Summary in French.] **686**

The initial forms of the piroplasm (macromerozoites or clavate forms) occurred in the salivary glands of *D. marginatus.* Later, three types of schizonts were found in the intestine of the tick.—R.M.

Shmulevich, A. I. (1957). [**Experimental chemoprophylaxis with pyraldin in bovine piroplasmosis.**] — *Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 271-273. [In Russian.] **687**

In a previous publication S. stated that pyraldin was of no prophylactic value in piroplasmosis [*V.B.* **28,** 1409]. However, further experiments using 7 bull calves (and 4 controls) demonstrated a prophylactic effect if the drug was injected s/c up to 5 days before experimental infection. The dose was 5–10 mg./kg. body wt. It was stated that trials on infected farms had also been successful.—R.M.

Stepanova, N. I. (1957). [**Epidemiology of *Babesia ovis* infection.**] — *Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 123-141. [In Russian. Summary in French.] **688**

S. described experiments on the role of *Rhipicephalus bursa* in the spread of ovine piroplasmosis.—R.M.

Anon. (1958). **Recommended procedure for a standardized complement-fixation test for anaplasmosis.**—*Proc. 61st Ann. Meet. U. S. live Stk sanit. Ass., St. Louis,* 1957. pp. 82-93. **689**

Details are given of a standard technique recommended by a special committee of the U.S. Livestock Sanitary Association, based on procedure developed by the Animal Disease and Eradication Division of the Agricultural Research Service.—R.M.

Gibson, C. L. & Eyles, D. E. (1957). **Toxoplasma infections in animals associated with a case of human congenital toxoplasmosis.**—*Amer. J. trop. Med. Hyg.* **6,** 990-1000. **690**

Toxoplasms were recovered from 7 of 35 cats, 2 of 3 ducks, 3 of 7 fowls, 1 of 16 pigeons and 7 of 121 mice captured in the vicinity of a dwelling where a human case occurred. No infection was found in 22 small wild birds.—R.M.

Lewis, W. P. & Markell, E. K. (1958). **Acquisition of immunity to toxoplasmosis by the newborn rat.**—*Exp. Parasit.* **7,** 463-467. [Authors' summary modified.] **691**

Normal unweaned rats are highly susceptible to infection with *Toxoplasma gondii,* which generally proves fatal in animals less than three weeks old. In contrast, sucklings born to adult rats which have acquired a chronic infection show a marked increase in survival rate after infection. The survival rate is still higher, approaching that seen in adult animals, in infant rats born to normal mothers but suckled by rats which have a chronic infection. Transplacental and translacteal passage of antibodies both take place; antibodies obtained in the latter manner are available for a longer period, and this factor may explain their apparently greater efficacy.

See also abstr. 840 (suramin); 909 (report, Nigeria).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

U.S.A. (1957). **Annual Report of the Pan American Foot and Mouth Disease Center, 1956.** [SOPER, F. L.] pp. 29. Washington, D. C. : The Pan American Sanitary Bureau. **692**

This centre, established in 1951, is at São Bento near Rio de Janeiro, Brazil, on a site and in buildings provided by and maintained to a great extent by the Government of Brazil.

The Centre provides services for the diagnosis of foot and mouth disease throughout the American states and also consultant services to Governments of these countries.

Training courses for Veterinary Officials from the American states are conducted, as well as research on the nature of F. & M. disease and allied viruses in developing new or improved techniques and vaccines against this disease, which is the greatest obstacle in the development of the livestock industry of many countries in Latin America.

The report states that operations are limited owing to the inadequate facilities and overcrowding of the limited space available both in the laboratories and offices.

A pilot vaccine plant had been established and arrangements made for obtaining the large volume of materials required by the end of the year. Small-scale field trials with a rabbit-adapted virus had been started.

The advisory services have been meeting the growing demand for information on the prevention of the disease by visits to affected countries and also by advice through correspondence.

A review of the preliminary work to obtain an attenuated type "O" strain virus through rabbits is given, but the work done up to the end of the year was not considered conclusive. In one case of six rabbits inoculated with types "O", "A" and "C", five were found infected with type "C" and one with types "A" and "C". Further investigation is necessary to confirm this observation.

Further active developments of the Centre's research and vaccine production were expected in the following year with the new facilities for opening up the vaccine field plant.

Dr. William M. Henderson from the Foot and Mouth Disease Research Institute at Pirbright, England, was expected to take up the vacant post of Director at the Centre in January 1957.—J. A. GRIFFITHS.

DE CASTRO, M. P. & MELLO, D. (1957). Tecido renal de cobaia cultivado por nova técnica e sua sensibilidade ao vírus da febre aftosa. **[Guinea-pig renal tissue cultivated by a new technique and its susceptibility to foot and mouth disease virus.]** — *Arch. Inst. biol. S. Paulo* **24,** 163-167. [Abst. in English.] **693**

Trypsinized kidney cells were smeared on the dry surface of culture tubes and allowed to adhere for about 20 min. before culture medium was added. 116 tubes could be prepared from kidneys of one g.pig.—R.M.

KHERA, K. S. (1958). Effet cytopathogène du virus de la fièvre aphteuse en couche monocellulaire de rein de porc. **[Cytopathogenic action of foot and mouth disease virus on pig kidney cells in monolayer cultures.]** — *Ann. Inst. Pasteur* **95,** 385-393. [Summary in English.] **694**

K. described the morphology of epithelial and endothelial cells from pig kidney in normal tissue cultures and in cultures infected with F. & M. disease virus. There are 6 photomicrographs.—R.M.

BROWN, F., SELLERS, R. F. & STEWART, D. L. (1958). **Infectivity of ribonucleic acid from mice and tissue culture infected with the virus of foot-and-mouth disease.** — *Nature, Lond.* **182,** 535-536. **695**

Ribonucleic acid, prepared from F. & M. disease virus grown on pig kidney cell cultures, produced lesions in cell cultures, paralysed and killed mice inoculated i/m, and yielded in mice and in cell cultures virus of the same immunological type as the original strain. In this article the authors discussed evidence which showed that the ribonucleic acid was free from intact virus.—R.M.

CARTWRIGHT, S. F. & THORNE, H. V. (1958). **Use of two properties of the virus of foot-and-mouth disease in studies of its multiplication.** —*Nature, Lond.* **182,** 717-718. **696**

Multiplication of two strains of the virus (Ven. 1 and Dutch *O*) was studied in tissue cultures of tongue epithelial and pig kidney cells. The authors had found the virus to be resistant to the detergent sodium dodecyl sulphate, which rapidly and completely disrupted the cells. As the virus is known to be unstable at pH values below neutrality, the pH of the infected cell suspension was adjusted to 5·0–6·0 and restored to normal (7·6) after 50–70 min. Part was then titrated by inoculating unweaned mice, and part after treatment with an equal volume of the detergent (1%) in phosphate buffer to deter-

mine residual virus, the remainder being incubated at 37°C. and titrated for yield of virus after multiplication. With the Ven 1 strain, the cell-associated virus was of the order of 1 infective unit per 100 infected cells with pH treatments at 5·5 and above up to 15 min; longer times at low pH slowed down multiplication: with the Dutch strain no such increase occurred with time. It was shown that F. & M. disease virus becomes non-infective on entering the cell, and that adsorption and penetration occurs in less than 1 min. at 37°C.—W. K. Dunscombe.

Skalinskii, E. I. (1957). **[Intradermal inoculation of cattle with small doses of foot and mouth disease vaccine.]** — *Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 161-164. [In Russian.] **697**

S. inoculated i/d 1,845 cattle on infected farms with 0·5 ml. of vaccine and 217 of them developed F. & M. disease within 4 or 5 months after inoculation. On farms adjoining infected farms 10,722 cattle were inoculated and 184 became infected.—R.M.

Cooper, P. D. (1958). **'Shortened latency' as a result of multiple infection by vesicular stomatitis virus in chick cell culture.**—*J. gen. Microbiol.* **19,** 340-349. [Author's summary.] **698**

Above a value of one, repeatedly doubling the multiplicity of infection of chick embryo cells by vesicular stomatitis virus progressively shortened the latent period by about 0·6 hr.; this phenomenon is referred to as 'shortened latency'. Varying the multiplicity above unity with dilute-passage stocks did not interfere with rate of infective virus release, number of cells infected, or final yield, *i.e.*, there was no 'von Magnus' effect or other obvious interference phenomena.

The doubling time for virus release was also about 0·6 hr. This suggested that virus may have been growing as a simple intracellular pool equally accessible to all adsorbing virus, and that 1 particle was released when the pool reached a certain size (perhaps 20–200 units) irrespective of inocula. However, other explanations are possible, and of those allowing experimental test, earlier initial adsorption of virus, multiplicity reactivation amongst a partly inactivated population, more rapid elution of attached virus or more rapid release of accumulated internal virus could not account for shortened latency.

Cooper, P. D. (1958). **Homotypic non-exclusion by vesicular stomatitis virus in chick cell culture.** — *J. gen. Microbiol.* **19,** 350-364. [Author's summary.] **699**

Placing live or inactivated vesicular stomatitis virus of one serotype on chick cells in tissue culture prevented most of the cells from releasing infective virus of the other serotype when super-infected with it (heterotypic exclusion). Inactivated virus did not prevent super-infection with the same serotype and had no effect on the latent period or rate of virus release (homotypic non-exclusion and non-interference). The 'Indiana' serotype was more effective as heterotypic excluding agent than was the 'New Jersey' serotype, and exclusion was noticeable when only 12 min. elapsed between interfering and challenge virus. Each cell liberated virus of only one serotype when infected with live virus of both serotypes, but the serotype released was often (20–40%) not that of the particle first adsorbed. Heterotypic exclusion in fact behaved as if it were reversible and dependent on the multiplicities of infection, at least within the latent period. Many inactivated particles per cell were adsorbed before heterotypic exclusion was achieved.

Sanders, M., Soret, M. G. & Akin, B. A. (1958). **Neurotoxoid interference principle in pseudorabies infection, *in vivo* inactivation of Aujeszky virus.**—*Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* p. 293. [Abst. from authors' abst.] **700**

A combination of one part *Crotalus terrificus terrificus* toxoid to four parts of *Naja flava* toxoid has been used with success in rabbits infected with Aujeszky's disease virus. The size of the infecting dose, and the amount of toxoid, are critical. Rabbits infected with 10 LD_{50} Aujeszky virus and injected 4 hours later with 0·25 ml. toxoid combination twice daily, for a total of 6 doses, survive the fulminating experimental infection to a significant degree.

Kaeberle, M. L. (1958). **Newer tools for the prevention of rabies in domestic animals.** — *Ann. N.Y. Acad. Sci.* **70,** 467-479. **701**

K. emphasizes that in the U.S.A. a number of cattle and other valuable animals are affected yearly. Continual efforts have been made to improve the various vaccines because of the reactions and the limited duration of immunity after a single injection (in dogs). Chick embryo vaccines have lessened the risks materially and the low-egg passage (LEP) Flury vaccine has produced good immunity in dogs both in the laboratory and in the field, much better than tissue (N-T) vaccines. For example, in New

York State since 1950, of more than 300,000 dogs vaccinated only 4 died from rabies.

Puppies do not respond so well as adult dogs, and cats and kittens seem more resistant to challenge by street virus than dogs, though it they develop the disease it is nearly always of the furious type. Cats given LEP vaccine had considerable protection, though N-T vaccines may be better for adults, and those less than 6 months old should not receive live virus.

Cattle are quite susceptible to rabies, and since LEP vaccine used prophylactically against bat-transmitted rabies in Central America showed some adverse effects on cattle, the high-egg-passage (HEP) vaccine is used. For animals anti-rabic serum is not generally used on account of cost. For post-exposure prophylaxis in dogs the following method is useful: treat with anti-rabic serum followed by 1-3 doses of LEP, or 14 of N-T vaccine. If the animal has been vaccinated within 1 year with N-T, or within 3 years with LEP, re-vaccinate and quarantine for 30 days. [No figures are given of the fate of dogs bitten by proved rabid animals and subsequently treated as advised above.]—W. K. Dunscombe.

Burns, K. F., Shelton, D. F. & Grogan, E. W. (1958). **Bat rabies: experimental host transmission studies.**—*Ann. N.Y. Acad. Sci.* **70,** 452-466. **702**

Rabies virus has been recovered from naturally infected solitary and colonial insectivorous bats from several parts of the U.S.A. In an attempt to evaluate the public health importance of bat rabies, the authors tested: (a) the ability of laboratory and naturally infected bats to transmit the disease to other animals, and (b) the susceptibility of other animals to bat rabies virus (BRV).

Many species of animals including monkeys, goats, rabbits, g.pigs and mice were tested; the bat virus was identified as rabies by mouse intracerebral neutralization tests, and fixed virus was used as a control. The criteria were the presence of Negri bodies in mouse brain smears, or the standard neutralization test. Saliva samples from the bats were inoculated intracerebrally into mice; other routes used for the other animals were i/m, s/c, and i/p. Experiments:—(a) Monkeys and bats were confined together in cages and in a number of instances the bats bit the monkeys. Pools of bat brain and salivary glands were prepared from the inoculated and naturally infected bats, and normal controls (in the naturally infected pool, 2 pooled brain/salivary gland isolates showed virus). None of the monkeys became infected in 120 days of observation; all were then challenged to prove susceptibility, and those challenged with the BRV strains showed signs on 6th-8th days with death on 7th-10th. Sera taken when the animals were moribund were negative for rabies neutralizing antibodies (RNAB). No Negri bodies were found, and mice inoculated intracerebrally with brain tissue became rabid, but not when inoculated with monkey salivary glands. (b) Laboratory infected pallid bats showed virus in the salivary glands though in biting experiments on g.pigs none of these developed rabies, and their sera were negative for RNAB. (c) Three of four goats inoculated intracerebrally died from rabies, the 4th became ill but recovered and then resisted intracerebral challenge with a heavy dose of BRV, though sera taken on the 41st and 50th days after inoculation were RNAB negative. (d) Virus was recovered from the salivary glands of one of eight rabbits inoculated s/c; three of three g.pigs survived after i/p inoculation. (e) Of six day-old chicks inoculated, five survived, one died from rabies; all their sera showed RNAB. (f) Of 10 apparently normal bats inoculated i/m, 3 died within 3 days, 6 died 5-9 days after inoculation and the tenth survived for 70 days. Intracerebral inoculation of mice with brain and salivary glands from these bats was negative, Negri bodies were absent, but the histology was characteristic.

The authors suggest that infected insectivorous bats are important in sylvatic rabies and that inability to produce deep penetrating bites might be the reason for the negative transmission studies, and though RNAB have been reported from wild bats thus suggesting infection and possible recovery, there is no proof of survival and in the experiments with insectivorous bats all died. The authors emphasize that since virus was isolated from the saliva, persons bitten by bats should be considered at risk.

—W. K. Dunscombe.

Powell, H. M. & Culbertson, C. G. (1958). **Inactivation of fixed rabies virus, grown on embryonated duck eggs, by means of beta propiolactone.** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* p. 292. [Abst. from authors' abst.] **703**

When beta propiolactone 1:4,000 is used at 4°C. titres decrease, *e.g.* from $10^{-6.24}$ at zero hours, to $10^{-3.8}$ at two hours, then to $10^{-2.2}$ at four hours, and inactivation is complete before 24 hours. Virus killed in this way is an effective vaccine as determined by mouse immunization and by production of neutralizing antibody in man.

ALLSOP, P. A., DOWNIE, A. W. & DUMBELL, K. R. (1958). **Studies on a variant of cowpox virus.** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* p. 263. [Abst. from authors' abst.] **704**

A variant of cow pox virus was reported in 1952 by Downie & Haddock [*V.B.* **23,** 102] and van Tongeren [*V.B.* **23,** 1539].

The present paper reports attempts to test whether the variant had a limited ability to multiply in tissue culture of mesodermal origin. The development of cytopathogenic changes and the multiplication of virus were studied in a variety of cell cultures for both cow pox and its variant. The variant strain normally appears to be stable; it remained true to its character on first isolation after repeated passage on the chick chorio-allantois. Serial passage in tissue cultures of mesodermal origin yielded some evidence of the emergence of a form which once again produces haemorrhagic lesions on the chick chorio-allantois.

ÖZCEBE, İ., GÜLEY, M. & ÖZAKŞIT, A. (1958). Koyun çiçegine karşi yeni bir aşı: ovi-cap. **[Goat-adapted sheep pox virus.]**—*Türk vet. Hekim. dern. Derg.* **28,** 4-14. [In Turkish. Abst. from English summary.] **705**

After 15 passages in goats, the virus produced only a local reaction in sheep. Addition of hyaluronidase to the virus facilitated adaptation in the goat. A preparation containing 500 lethal doses for goats, protected sheep for at least 9 months.—R.M.

TODD, W. M. & RANDALL, C. C. (1958). **The Feulgen reaction of fowlpox inclusions after lipid extraction.** — *Arch. Path.* **66,** 150-153. [Authors' summary modified.] **706**

The presence of Feulgen-positive material in the cytoplasmic inclusion bodies occurring in chick cells infected with fowl pox virus was confirmed. It was shown by various controls that this is not a false-positive reaction and that the reaction is not due to the presence of lipid in the inclusion matrix.

SIEGEL, B. V. (1958). **Pattern of avian virus synthesis studied in ultrathin tissue sections.** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* pp. 249-250. [Abst. from author's abst.] **707**

While the fine structure of pox viruses has been previously demonstrated, the sequence of events in the formation of these structures has, generally, not been elucidated. An attempt was made to study directly the changes taking place over a period of 96 hours, following infection of the chorioallantois of chick embryos with a strain variant of canary pox virus.

OKER-BLOM, N., STRANDSTRÖM, H. & ANDERSSON, P. (1958). **Distribution and transmission of the virus of tick-borne encephalitis in Finland.** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* p. 261. [Authors' abst. modified.] **708**

Serum neutralization tests in mice and in tissue culture with louping-ill virus revealed the presence of the Russian spring-summer encephalitis (RSSE)–louping-ill group of viruses in Finland. Neutralizing antibodies were demonstrable in a high percentage of sera from sheep and cattle in the endemic region. This finding and the experimentally proved transmission of RSSE virus by infected goat's milk led to an investigation of the probable role of cows in the transmission of the disease.

KAWECKI, Z. & WYSOCZYNSKA, H. (1958). **Isolation of strains of tick encephalitis from *Microtus arvalis* in the Szczecin district.** — *Bull. Inst. mar. Med. Gdańsk* **9,** 5-10. [In English. Summaries in Polish and Russian.] [Abst. from abst. in *Rev. appl. Ent. Ser. B.* **46,** 119 (1958).] **709**

An account of the isolation in mice of five strains of virus from the brains of voles (*M. arvalis*) taken in the Polish coastal zone in 1953. The strains were serologically similar to the Russian strain of tick-borne encephalitis, somewhat less similar to the Czechoslovakian strain and a Scottish strain of louping-ill, and quite distinct from Theiler's mouse virus. They were pathogenic for chick embryos when introduced into the chorioallantoic membrane and for white mice when inoculated intracerebrally and intraperitoneally, but not to g.pigs or white rats when inoculated intracerebrally or to rabbits when inoculated on a scarified cornea. This behaviour is typical of tick encephalitis.

MAKOWER, H. & SKURSKA, Z. (1957). Badania nad wirusami Coxsackie. Doniesienie III. Izolacja wirusa Coxsackie z mózgu lisa. **[Studies on Coxsackie viruses. III. Isolation of Coxsackie virus from the brain of a fox.]** —*Archiwum Immunol. i Terapii Dośw.* **5,** 219-224. [In Polish. English summary modified.] **710**

Coxsackie virus Dalldorf's A_4 type was isolated from the brain of a fox which died from encephalitis. This is stated to be the first report on the natural occurrence of Coxsackie virus in carnivorous animals, and the second one in mammals.

VON ZEIPEL, G. & SVEDMYR, A. (1958). **Growth of viruses of the Russian spring-summer louping-ill group in tissue culture.**—*Arch. ges. Virusforsch.* **8,** 370-384. [In English. Authors' summary modified.] **711**

Louping-ill virus has been tested for cytopathogenicity in tissue cultures of continuously grown cell lines (HeLa, KB and Detroit 6) as well as in cultures of trypsin-dispersed human and monkey tissues (human amnion and kidney, monkey kidney). No cytopathogenic effect was found in the normal cells tested. Of the continuous cell lines the Detroit 6 strain was the best, showing a marked and reproducible cytopathogenic effect without previous adaptation and a high yield of infectious virus and complement-fixing antigen. Moreover these cells were about as sensitive as mice to minimal doses of the virus.

LIBIKOVÁ, P., ALBRECHT, P. & REHÁČEK, J. (1958). Beitrag zum Problem der Zirkulation des Virus der Nordamerikanischen Pferdeenzephalomyelitis (EEE) in der Natur. **[Circulation of Eastern equine encephalomyelitis virus in nature.]**—*Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* pp. 259-260. [In German.] **712**

Experimental infection of horses, goats, sheep, a piglet and a deer by i/m or i/p routes was soon followed by viraemia which lasted for 1 or 2 days: intranasal infection did not result in viraemia. Distribution of the virus in the body was studied: it was particularly prevalent in fat tissue (except after intracerebral infection). Transovarial transmission of the virus through *Ixodes ricinus* and *Dermacentor marginatus* did not occur, but adult ticks could transmit infection. There was a high concentration of virus in faeces of infected ticks.—R.M.

ROTT, R. & NITZSCHKE, E. (1958). Untersuchungen über die Züchtung des Virus der Bornaschen Krankheit im bebrüteten Hühnerei unter verschiedenen Bedingungen. **[Cultivation of the virus of Borna disease in embryonated hen eggs under various conditions.]** — *Zbl. VetMed.* **5,** 629-633. [Summaries in English, French and Spanish. English summary modified.] **713**

The virus of Borna disease was transmitted by inoculation on to the dropped chorion of 5-day eggs, then through 4 alternate passages in rabbits and in hens' eggs and finally through 15 consecutive egg passages. Infective virus was detected in the membranes, 6, 9, 12 and 15 days after inoculation, but not on the fourth day. Lowering the temperature to 35° or 35·5°C. during the second half of the period of incubation seemed to favour virus multiplication. The virus also grew on the chorio-allantois of 11-day eggs. Inoculation into de-embryonated eggs was unsuccessful as was inoculation into the yolk sac.

NITZSCHKE, E. (1958). Variation beim Virus der Bornaschen Krankheit (infektiöse Encephalomyelitis der Pferde und Schafe) durch Rattenpassagen. **[Variation in the virus of Borna disease after passage in rats.]**—*Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* pp. 275-276. [In German.] **714**

The virus became adapted to rats after 32 continuous passages by subdural inoculation. Alternate intracerebral passage in rabbits and rats shortened the incubation period and the period of survival of rabbits.—R.M.

BRACKEN, E. C. & NORRIS, J. L. (1958). **Electron microscopy of equine abortion virus.** — *Proc. Soc. exp. Biol., N.Y.* **98,** 747-750. [Authors' summary modified.] **715**

Hepatic cells from young hamsters in late stages of infection with equine abortion virus were studied with the electron microscope. Various forms in which virus particles were seen, are described, and their similarity to other viruses is discussed. Virus particles were observed predominantly in the nuclei. "Nests" of virus particles were seen, but these were not considered to be equivalent to the intranuclear inclusion bodies characteristically seen by light microscopy. No structures identifiable as inclusion bodies were seen. Other cytopathogenic effects are described.

JOHNSON, R. H. (1958). **An outbreak of rinderpest involving cattle and sheep.**—*Vet. Rec.* **70,** 457-461. **716**

Only two outbreaks of rinderpest in sheep or goats have ever been reported in Africa despite the widespread prevalence of the disease in cattle. In 1957, rinderpest broke out amongst White Fulani cattle at the Vom Veterinary Research Station in the plateau area of Northern Nigeria and within a week was observed and confirmed serologically in 54 of the laboratory flock of 110 indigenous Plateau dwarf sheep with which the cattle had been in intimate contact. Symptoms and P.M. findings were similar to those seen in cattle except that salivation and gall-bladder lesions were absent and ocular discharges uncommon. Twelve sheep died and the rest were slaughtered for policy reasons but the disease appeared more rapid and severe than in the cattle. Possible reasons for the irregular be-

haviour of rinderpest virus in sheep are discussed.—A. Ackroyd.

Bol, B. K. & Akulov, A. V. (1957). **[Histopathological changes in the organs in rinderpest.]** — *Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 165-176. [In Russian.] **717**

The authors studied histological sections of parenchymatous organs, digestive tract, lymph nodes and central nervous system from 3 calves which had died from experimental infection. The lesions were those of severe acute sepsis. There was acute diffuse non-purulent encephalitis. Lesions differed from those found in spontaneous cases and this may have been due to absence of complications due to secondary infections in the calves.—R.M.

Carter, G. R. & Mitchell, C. A. (1958). **Method for adapting the virus of rinderpest to rabbits.**—*Science* **128,** 252-253. **718**

A virulent strain of rinderpest virus was adapted to rabbits by alternate passage between embryonated eggs and rabbits. The virus was propagated in eggs without loss of virulence for cattle, by the method described by Shope *et al.* [*V.B.* **16,** 1532]. After 43 passages on chorioallantoic membranes the virus was alternately passaged in rabbits four times, after which it could be passaged serially in rabbits.—R.M.

Knight, G. J. (1958). **Quality control of lapinised rinderpest vaccine.**—*Bull. epiz. Dis. Afr.* **6,** 165-170. [Summary in French pp. 200-201.] **719**

Two distinct types of test are used in examining the Muguga lapinized rinderpest vaccine before it is accepted for issue. The first method involves rabbit titrations to establish the dose, expressed as a dilution, necessary to infect 50% ($I.D._{50}$) of a rabbit population. A cattle test is then performed involving 10 animals, 9 of which are immunized with dilutions of vaccine based on its rabbit $I.D._{50}$ and challenged. A vaccine is accepted if none or only one animal reacts. How these methods came to be evolved, their limitations and possible ways of improving them are described.—A. Ackroyd.

Prusova, L. G. (1958). **[Tissue therapy of cutaneous papilloma of the udder of cows.]**—*Veterinariya, Moscow* **35,** No. 11. pp. 41-43. [In Russian.] **720**

P. stated that papillomas of the skin of the udder were frequently seen in high-yielding cows in Kiev oblast. He described the preparation of an extract of ox liver. This extract was injected s/c into the shoulder for from 3 to 5 times at intervals of 10–12 days. It was claimed that this treatment resulted in the disappearance of warts on the teats and udder in 20 of 21 cows. In 11 cows, "thorn-shaped" papilloma disappeared after 3 treatments. No recurrences were noted within 2 or 3 years. A histological study indicated that at the end of the period of treatment, cylindrical and cuboidal epithelium in the papilloma was replaced by cornified tissue; at this stage the papilloma became detached.

—R.M.

I Zlotnik, I. & Rennie, J. C. (1958). **A comparative study of the incidence of vacuolated neurones in the medulla from apparently healthy sheep of various breeds.**—*J. comp. Path.* **68,** 411-415. **721**

II. Zlotnik, I. (1958). **The histopathology of the brain stem of sheep affected with experimental scrapie.** — *Ibid.* 428-438. [Authors' conclusions modified.] **722**

I. Vacuolated neurones were found in the medulla of apparently healthy sheep from flocks free from scrapie, and even in those of breeds unaffected by natural scrapie. The number of vacuoles throughout the medulla was generally very low, only exceptionally exceeding one per section. These findings were discussed in relation to the laboratory diagnosis of scrapie. [See also *V.B.* **27,** 1757; **28,** 117.]

II. Vacuolation of neurones is a constant lesion in experimental scrapie and precedes the clinical disease. The trapezoid body, where vacuoles are rarely observed in healthy animals, is always affected in the experimental disease. In experimental scrapie vacuolation in the pons is at least as severe as in the medulla.

Lesions in experimental scrapie are similar in sheep inoculated intracerebrally or subcutaneously.

Boidin, A. G., Cordy, D. R. & Adler, H. E. (1958). **A pleuropneumonialike organism and a virus in ovine pneumonia in California.**—*Cornell Vet.* **48,** 410-430. [Authors' summary modified.] **723**

Pleuropneumonia-like organisms and a large virus recovered from ovine pneumonia lesions were characterized in the laboratory and their pathogenicity in lambs studied. The PPLO did not produce pneumonia but did cause arthritis in many of the experimental sheep. The virus regularly produced lesions of bronchiolitis and pneumonia. These resembled more closely certain clinically silent foci in slaughter lambs than acute lobar pneumonia as seen in the field.

Young, S., Parker, H. & Firehammer, B. D. (1958). **Abortion in sheep due to a virus of**

the psittacosis-lymphogranuloma group. — *J. Amer. vet. med. Ass.* **133,** 374-379. [Authors' summary modified.] **724**

Abortions in sheep are reported from which a virus of the psittacosis–lymphogranuloma group was isolated by inoculation of chick embryos. Elementary bodies were demonstrated in the foetal cotyledons, and complement-fixing antibodies of the psittacosis group occurred in the serum of affected sheep. This disease is similar to the virus disease known in Scotland as enzootic abortion.

KUMAGAI, T., SHIMIZU, T. & MATUMOTO, M. (1958). **Detection of hog cholera virus by its effect on Newcastle disease virus in swine tissue culture.**—*Science* **128,** 366. **725**

Swine fever virus grew in cell monolayer cultures of pig testicle without producing cytopathogenic effects. Newcastle disease virus multiplied slowly without cytopathogenic effect when transferred after 5 days' cultivation to a fresh cell culture, although it multiplied rapidly and was cytopathogenic when transferred after 6–8 days. Addition of swine fever virus to cultures of N.D. virus transferred on or before the 5th day accelerated proliferation of N.D. virus and resulted in plaque formation. This phenomenon was the basis of a test for detecting the presence of swine fever virus in blood or organs of pigs.—R.M.

SAUNDERS, L. Z., JUBB, K. V. & JONES, L. D. (1958). **The intraocular lesions of hog cholera.** —*J. comp. Path.* **68,** 375-379. [Authors' conclusions modified.] **726**

Intraocular inflammatory changes were found in a histological study of natural and experimental swine fever. The lesions were chiefly retinitis and anterior uveitis and in a few cases choroiditis. These are analogous to the lesions occurring in canine distemper and Borna encephalitis and suggest that invasion of the intraocular tissues is a fundamental attribute of viruses which cause encephalomyelitis.

MAYR, A. (1958). Ein Gewebekulturimpfstoff gegen die ansteckende Schweinelähmung. **[Tissue culture vaccine against Teschen disease. I. Preparation.]**—*Zbl. Bakt. I. (Orig.)* **172,** 465-480. [Summaries in English, French and Spanish. English summary modified.] **727**

This Teschen disease vaccine is a virus modified by tissue culture passage. It is not pathogenic for young pigs after intracerebral inoculation. Its antigenic and immunizing potency is preserved after many passages. After harvesting the virus is purified with 10% chloroform; this substitutes filtration and is a considerable advantage. Equal parts of virus suspension purified by chloroform and of 1% aluminium hydroxide suspension are mixed. The virus is inactivated by formalin at pH 7·3 for 48 hours. The virus determination during the inactivation and final safety tests of alum-adsorbed vaccines can be performed in tissue cultures after the elution of specimens with $\frac{1}{3}$M phosphate buffer.

UNDERDAHL, N. R. (1958). **The effect of *Ascaris suum* migration on the severity of swine influenza.**—*J. Amer. vet. med. Ass.* **133,** 380-383. [Author's summary modified.] **728**

Two to three-week-old pigs develop severe pneumonia when inoculated with swine influenza virus (Shope S-15) during the migration of *Ascaris lumbricoides* larvae through the lungs. In pigs infected with ascaris plus virus, 56% died or were moribund, as compared with 4% in virus-infected controls. Ascarid migration in animals with older established influenza infections did not cause high mortality, although lung lesions were more severe.

CARMICHAEL, L. E. & SARKAR, S. (1958). **An indirect hemagglutination test for detecting infectious canine hepatitis virus antibodies.**—*Cornell Vet.* **48,** 386-393. [Authors' summary modified.] **729**

The test described is based on the principle that agglutination occurs when homologous antiserum is incubated with virus adsorbed on tanned sheep r.b.c. Formolized test antigen can be stored in the frozen state for at least 6 weeks.

HARTLEY, W. J. (1958). **Some observations on canine viral hepatitis.**—*N. Z. vet. J.* **6,** 111-117. [Author's summary modified.] **730**

An account of fatal canine viral hepatitis as seen in New Zealand. Only two-thirds of the cases were clinically and pathologically typical. Intranuclear inclusion bodies in the medullary collecting tubules are recorded and the significance of abnormal levels of liver lead and kidney copper is discussed.

RUEBNER, B., BRAMHALL, J. L. & BERRY, G. R. (1958). **Experimental virus hepatitis in choline-deficient mice with fatty livers.** — *Arch. Path.* **66,** 165-169. [Authors' summary modified.] **731**

It was concluded that the fatty liver of choline deficient mice was no more susceptible to virus hepatitis than the histologically normal liver of mice fed a choline supplement. The mere presence of fatty change in the liver, therefore, may not necessarily be of great functional importance.

HUPPERT, J. & SANDERS, F. K. (1958). **An infective 'ribonucleic acid' component from tumour cells infected with encephalomyocarditis virus.** — *Nature, Lond.* **182,** 515-517. **732**

The virus of murine encephalomyocarditis was propagated in cells of Krebs 2 mouse ascites carcinoma. Ribonucleic acid extracts of the virus were prepared by extraction of culture fluids with phenol. The authors set out to prove that the low infectivity of the extracts was not due to residual intact virus; that the infective material in the extracts came from the virus and not from some other component of the cell culture; and that the infectivity of extracts was due to virus ribonucleic acid.—R.M.

FREDRICKSON, T. N. & CHUTE, H. L. (1958). **Further studies of chicken blood tests and their application.** — *Avian Diseases* **2,** 241-249. [Authors' summary modified.] **733**

Normal values are given for 10 different blood tests on broiler chickens, day-old to ten weeks of age. Upwards of 400 broilers were examined.

In Newcastle disease the w.b.c. and leucocyte differential count were of the greatest diagnostic value. The erythrocyte sedimentation rate, buffy coat values and plasma specific gravity were also altered during the disease.

I. SYURIN, V. N. (1957). **[Adaptation of Newcastle disease virus to mammals.]**—*Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 91-105. [In Russian.] **734**

II. SYURIN, V. N. & SKALINSKII, E. I. (1957). **[Pathological changes in guinea-pigs infected with an adapted strain of Newcastle disease virus.]**—*Ibid.* 106-115. [In Russian.] **735**

III. SYURIN, V. N. (1957). **[Haemagglutinating and antigenic properties of adapted Newcastle disease virus.]** — *Ibid.* 130-154. [In Russian.] **736**

I. S. studied Strain T of the virus, which was isolated in the U.S.S.R. in 1946. It was adapted to ducks by intracerebral inoculation through 30 passages. This duck-adapted virus was then passaged intracerebrally 214 times during 8 years in g.pigs. This virus killed 585 of 920 g.pigs, while virus passaged alternately in chick embryos and g.pigs killed 465 of 732 g.pigs. Symptoms shown by infected g.pigs and rabbits were described. When g.pigs were inoculated i/m, virus appeared in the blood 48–72 hours after inoculation.

II. In g.pigs infected intracerebrally with virulent or adapted N.D. virus, there was non-purulent disseminated encephalomyelitis (rarely meningo-encephalitis), also in some cases dystrophic and inflammatory lesions in parenchymatous organs, (11 photomicrographs).

III. N.D. virus adapted to g.pigs caused the formation of haemagglutination-inhibiting antibodies in fowls, which appeared 5–6 days after inoculation and persisted for 90–100 days at titres above 1 : 40 or 1 : 80. Titres of 1 : 10 or 1 : 20 persisted for 5–6 months and the fowls resisted inoculation of virulent N.D. virus during this period.—R.M.

BANKOWSKI, R. A., CORSTVET, R. & FABRICANT, J. (1958). **A tissue culture-modified Newcastle disease virus. II. Immunogenicity of the live tissue culture-modified Newcastle disease virus in chickens.** — *Avian Diseases* **2,** 227-240. [Authors' summary modified.] **737**

A tissue culture-modified live Newcastle disease virus administered intramuscularly to 5 and 30-day-old chicks did not produce any untoward reactions. The virus did not spread from vaccinated to susceptible chickens separated by wire partitions. Chicks lacking passive immunity were solidly immunized for at least 13 weeks by a single i/m dose of the vaccine. A poor immunological response was obtained when the virus was administered in the drinking water or by the conjunctival and intra-nasal routes. The presence of passive immune bodies markedly influenced immunological response to the virus.

SULLIVAN, J. F., GILL, E. & SOMER, A. M. (1958). **Immune response of chickens to *beta*-propiolactone-killed Newcastle disease vaccines.** — *Amer. J. vet. Res.* **19,** 483-488. **738**

Vaccines inactivated by propiolactone were prepared from 3 strains of N.D. virus ["GB-Texas", "Manhattan-Kan" and "Roakin-NJ"] grown in embryonated eggs. Chicks aged 14 days were inoculated s/c with 0·5 ml. of one or other of the vaccines. When the birds were challenged with the "GB-Texas" strain between 2 and 10 weeks after vaccination, an average of 93% were protected by "GB-Texas" vaccine and an average of 90 and 87% were protected by the other two vaccines.

Birds given a second inj. of vaccine a month after the first nearly all resisted challenge, and there was no difference in the protection conferred by each vaccine.—R.M.

INABA, Y., OMORI, T. & ISHII, S. (1957). **Miyagawanella: psittacosis-lymphogranuloma group of viruses. 3. Hemagglutination of psittacosis virus.**—*Jap. J. exp. Med.* **27,** 425-442. [In English.] **739**

Psittacosis virus agglutinated mouse erythrocytes but the following mammalian viruses did not: feline pneumonitis, sheep pneumonia [*V.B.* **22,** 3705], goat pneumonia [*V.B.* **25,** 1997] and three bovine strains of the psittacosis–lymphogranuloma group. Properties of the haemagglutinin were described.—R.M.

I. Morimoto, T., Omori, T., Ishii, S. & Matumoto, M. (1958). **Miyagawanella: psittacosis-lymphogranuloma group of viruses. 6. Detection of indirect complement fixing antibodies against psittacosis in chicken serum.** —*Jap. J. exp. Med.* **28,** 213-224. [In English.] **740**

II. Inaba, Y., Omori, T., Morimoto, T., Kurogi, H., Kono, Y., Ishii, S. & Matumoto, M. (1958). **Miyagawanella: psittacosis-lymphogranuloma group of viruses. 7. Psittacosis virus in Japanese pigeons.**—*Ibid.* 225-242. [In English. Authors' summaries modified.] **741**

I. Some factors influencing the indirect complement-fixation reaction of fowl serum for psittacosis virus were studied. Incubation was carried out at 37°C. for 1 hour, or at 4°C. for 5 hours. Satisfactory results were obtained with pigeon, g.pig and dog antisera as the indicator serum, but not with horse, goat and pig antisera.

Production of indirect c.f. antibody was studied in chickens infected with psittacosis virus by intratracheal and intramuscular routes; it was first detected 1 week following inoculation, reached a maximum titre in 2 or 3 weeks and then gradually decreased.

Of 103 fowls tested 16 (15·5%) had antibody in titres of 1:4 to 1:16, suggesting that psittacosis virus may be widely disseminated among fowls in Japan.

II. A serological survey of psittacosis in pigeons in Tokyo revealed a high incidence of antibodies. The virus was isolated from 5 of 23 pigeons, most of which were apparently healthy.

The isolated virus resembled psittacosis virus in morphology, antigenicity and pathogenicity. However, the pigeon virus differs from that from other avian species in its high pathogenicity for pigeons particularly upon intracerebral inoculation.

Miles, J. A. R. (1958). **Factors involved in the conversion of latent ornithosis to the active phase.** — *Absts. of Proc. VIIth Int. Congr. Microbiol., Stockholm* pp. 14-15. [Author's abst. modified.] **742**

Work has recently been carried out in Otago, New Zealand on the activation of latent psittacosis established in mice by the i/p injection of a recently isolated parrot strain of the virus followed two days later by a s/c inj. of 1 mg. of chlortetracycline. A wide variety of treatments failed to lead to activation of virus, but after treatment with cortisone more than half the mice died within 3 days.

This work has been extended to pigeons whose serum gave a positive reaction in either the complement fixation or the c.f. inhibition tests. It was usually possible to isolate virus from the liver and spleen of about 50% of such pigeons by inoculation of a suspension into the yolk sac of chick embryos. After suitable doses of cortisone the pigeons do not show obvious ill-health, but virus can be isolated from nearly all birds by yolk sac inoculation. Most of these birds showed a very considerable drop in the titre of antibody demonstrable *in vitro* during the treatment. Even in pigeons known to be serologically positive, feeding of the diets deficient in thiamine used by Pinkerton & Swank [*V.B.* **12,** p. 214] did not regularly lead to activation of the virus.

Davis, D. E., Watkins, J. R. & Beasley, J. N. (1958). **Experimental psittacosis and ornithosis in turkeys: comparison of nine strains.** —*Avian Diseases* **2,** 315-321. [Authors' summary modified.] **743**

The effects produced by each of nine strains of psittacosis virus in turkeys are described. The gross lesions were the same for all strains; however, four highly pathogenic strains (all from turkeys) produced more severe lesions than the five mildly pathogenic strains which included three from psittacosis birds. Older turkeys were more resistant to infection than young poults.

Holmes, J. R. (1958). **Experimental transmission of avian osteopetrosis.**—*J. comp. Path.* **68,** 439-448. [Author's conclusions modified.] **744**

Avian osteopetrosis was induced by intraperitoneal injection into day-old chicks of whole blood, bone marrow or unfiltered plasma from birds with the active disease, also by injection of blood into the amnion of the developing chick embryo.

The findings indicated that a transmissible agent is concerned and suggested that one mode of transmission may be through the egg.

Grumbles, L. C., Flowers, A. I. & Cassidy, D. R. (1958). **The role of pleuropneumonia-like organisms in infectious sinusitis of turkeys.** — *Avian Diseases* **2,** 336-347. [Authors' summary modified.] **745**

Twelve strains of PPLO were isolated (5 from turkeys, 7 from fowls) and their ability to cause infectious sinusitis in turkeys was determined. Only 3 of the turkey strains and 2 of the fowl strains caused a grossly visible sinusitis in turkeys. No viral agent was demonstrable from any case of sinusitis. PPLO were isolated from each group that developed the disease.

A known strain of "Crawley virus" failed to cause a recognizable infection in ten turkeys inoculated in the sinus with undiluted allantoic fluid containing the virus. Furthermore this virus was not isolated from any group of turkeys with gross lesions of infectious sinusitis.

In three separate attempts, the Crawley virus survived three, but not four, cultural transfers in carbohydrate media enriched with PPLO serum fraction and incubated at 37·5°C.

MARMION, B. P. & STOKER, M. G. P. (1958). **The epidemiology of Q fever in Great Britain. An analysis of the findings and some conclusions.**—*Brit. med. J.* October 4th, 809-816. [Authors' summary modified.] **746**

Epidemiological investigations since 1949 have shown that Q fever is widespread in Gt. Britain.

Rickettsia burneti has been isolated from the milk of cows and goats and from the placenta and wool of sheep; also from the sheep tick, *Haemaphysalis punctata*, but not from *Ixodes ricinus* or *Dermacentor reticulatus*. There was some evidence of an increased frequency of infection in cattle in sheep-rearing areas of Kent and in some sheep ticks.

Attempts to find a reservoir of infection in wild mammals and birds were unsuccessful. Serological evidence of infection was found in fowls, but there are no grounds for assuming that they are an important reservoir of infection.

Infection in man has not been limited to those working with animals, but has been found in all sections of the community. Sporadic cases and outbreaks occurred at any time of the year, but were commonest in April–July.

Studies of the transmission of *R. burneti* to man have shown that sheep or cows were directly or indirectly the main sources of infection. Good evidence was obtained of the importance of unpasteurized cows' milk as a vehicle of infection.

See also abstr. **907** (report, Agricultural Research Council); **908** (report, Union of South Africa); **909** (report, Nigeria).

IMMUNITY

SPEIRS, R. S. (1958). **A theory of antibody formation involving eosinophils and reticulo-endothelial cells.** — *Nature, Lond.* **181,** 681-682. **747**

The theory was as follows. Antigen introduced into an organism produces two types of cellular reaction. First there is a specific eosinophile response at the site of injection and in the region of antigen fixation. The eosinophiles are chemotactically attracted to the antigen and react with it, producing specific enzymic changes on or within the cell. Secondly, the eosinophiles are phagocytosed by reticulo-endothelial cells and the specific enzyme is utilized by these cells to form antibody. During the ensuing process of antibody formation, the reticulo-endothelial cells undergo nuclear changes, the cytoplasm becomes more basophilic, and they are known as plasma cells.—R.M.

MARSHALL, J. D., EVELAND, W. C. & SMITH, C. W. (1958). **Superiority of fluorescein isothiocyanate (Riggs) for fluorescent-antibody technic with a modification of its application.**—*Proc. Soc. exp. Biol., N.Y.* **98,** 898-900. [Authors' summary modified.] **748**

The globulin fractions of antisera representing bacterial, viral, mycotic agents and antiglobulin fractions were labelled with two derivatives of fluorescein amine by three methods. Fluorescein isothiocyanate was superior in stability, ease of conjugation, and degree of fluorescence. This direct method of adding the dye to a dilute buffered antiserum eliminates the need for organic reagents which may denature the protein.

BANGHAM, D. R., INGRAM, P. L., ROY, J. H. B. SHILLAM, K. W. G. & TERRY, R. J. (1958). **The absorption of ^{131}I-labelled serum and colostral proteins from the gut of the young calf.**—*Proc. roy. Soc. Ser. B.* **149,** 184-191. [Authors' summary modified.] **749**

The several proteins in labelled serum and colostrum appeared to be absorbed with equal facility; there was no evidence that the calf gut showed any selectivity in the absorption of proteins as occurs in the young rat. Electrophoretic separation and measurements of radioactivity of calf serum taken 3, 6 and 20 hours after feeding with labelled whole serum indicated that the serum albumin and beta-globulin left the circulation at a rate greater than that of the gamma-globulins. Three hours after feeding,

8–16% of the labelled proteins were circulating in the plasma. At 20 hours 5–10% were present in the circulation.

SEN'KOV, Y. A. (1957). **[Clinico-morphological changes in cattle after transfusion with incompatible isogenetic blood.]**—*Trud. Novocherkassk. zootekh.-vet. Inst.* No. 10. pp. 391-397. [In Russian.] **750**

Blood samples from 484 cows were tested for compatibility: 120 of 5,261 tests were incompatible. 113 of the cows were of the Grey Ukrainian breed and in these only 0·9% of samples were incompatible. The minimum dose of incompatible citrated blood which caused symptoms when injected i/v was 25–200 ml., and the reaction lasted for only 1 or 2 hours. With doses of from 250 ml. to 2 litres transfusion shock lasted 4–6 hours and was associated with profuse diarrhoea and the voiding of pigmented urine. Peripheral blood was examined between 15 min. and 22 hours after transfusion: there was slight increase in the number of erythrocytes and in haemoglobin; leucopenia commenced within 15 min. of transfusion and lasted for 24 hours. After 24 hours there was a shift to the left in the nuclear index of neutrophiles. Other changes were pulmonary oedema and subpleural haemorrhages. When incompatible blood was stabilized by addition of a 15% soln. of calcium choride in the proportion of 1:10, reactions were less severe and the threshold dose increased to 150–300 ml.—R.M.

See also abstr. **609** (anthrax); **619** (Johne's disease); **623** (swine erysipelas; **633 & 637-645** (brucellosis); **650** (leptospirosis); **656** (braxy, ovine enterotoxaemia and lamb dysentery vaccine); **658** (haemorrhagic septicaemia and blackleg vaccine); **672-673** (pleuropneumonia antigen); **674** (serum spot plate test for PPLO); **689** (standardized c.f. test for anaplasmosis); **691** (toxoplasmosis); **692-697** (F. & M. disease); **700** (Aujeszky's disease); **701-703** (rabies); **705** (goat-adapted sheep pox virus); **718-719** (lapinized rinderpest virus); **727** (Teschen disease); **729** (canine virus hepatitis); **734-738** (Newcastle disease); **739-741** (Miyagawanella); **766** (schistosomiasis); **775-778 & 780** (helminth infestation); **788** (Rous sarcoma).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

RAFFENSPERGER, E. M. (1958). **The effects of Dow ET-57 on chicken shaft louse infestations.**—*J. econ. Ent.* **51,** 558-559. **751**

Groups of ten birds infested with *Menopon gallinae* were given oral doses of 250–1,000 mg./kg. Dow ET-57 as a 50% emulsifiable concentrate. One untreated fowl was added to each group as a source of re-infestation. Two birds receiving 1,000 mg./kg. died on the fourth day with typical symptoms of insecticide poisoning. 250 mg./kg. failed to eradicate the infestation; 500, 750 and 1,000 mg./kg. kept the birds free from lice for about 8-10 days. The palatability of insecticide–feed mixtures was tested, with Dow ET-57 incorporated as a 25% wettable powder into a standard laying mash at rates of 100–500 p.p.m. toxicant in feed. Feeding dropped off rapidly before a level of 25 mg. insecticide per kg. body wt. per day was reached, so that this means of administering the insecticide would be uneconomical.

—W. N. BEESLEY.

BURNS, E. & GOODWIN, E. E. (1958). **Tests with Dow ET-57 and Bayer 21/199 against cattle grubs in Southwest Louisiana.** — *J. econ. Ent.* **51,** 545. **752**

Dow ET-57 was given orally at the rate of 100 mg./kg. to small groups of cattle soon after the end of the warble fly season and/or two months later. Bayer 21/199 was sprayed on two similar groups of cattle at the rate of 0·5 gal. of 0·75% wettable powder suspension. Control was greatest (93-100%) when the insecticide was administered at the later date, although heavy rain washed away much of the spray deposit from the cattle treated at the early date.

Larger groups of cattle were used in the second experiment. Dow ET-57 was again fed at the rate of 100 mg./kg., but the Bayer 21/199 was sprayed at 0·5 gal. of 0·25, 0·50 or 0·75% suspension per cow. Treatment was given either at the same early date as before or only one month later. Greater control followed the early treatment, and this result may be more reliable than in the first experiment. Effective control followed the use of the 0·25% spray of Bayer 21/199.—W. N. BEESLEY.

SICART, M., RUFFIÉ, J. & MEIRA, M. (1958). L'évolution larvaire de *Oestrus ovis* (Linné, 1761). **[Larval development of *Oestrus ovis*.]** —*Ann. Parasit. hum. comp.* **33,** 295-302. **753**

The authors distinguished morphologically four stages of larval development, as opposed to the generally accepted three stages.—R.M.

BRUNDRETT, H. M. & GRAHAM, O. H. (1958). **Bayer 21/199 as a deterrent to screw-worm attack in sheep.** — *J. econ. Ent.* **51,** 407-408. **754**

11,065 sheep were treated with sprays of 0·25% or 0·5% Bayer 21/199 or with standard EQ-335 wound dressing smear (3% lindane), to give protection from *Callitroga hominivorax*

infestation of shear cuts. A further 408 sheep and goats were similarly treated against screw-worm attack following docking, lambing and other injuries. Sprays were mainly prepared from a 25% wettable powder, and each animal received about 1 quart of liquid at a pressure of 250-350 lb./sq. in. Most of the sprayed animals were protected for 2-3 weeks, while with EQ-335 protection lasted only 2-4 days. Cases of myiasis per 1,000 animals were: 0·5% spray 3·8; 0·25% spray 20·1; EQ-335 smear 50·4. An emulsion spray was used on some of the animals and the results were similar to those with the suspension.—W. N. Beesley.

Glasgow, J. P., Isherwood, F., Lee-Jones, F. & Weitz, B. (1958). **Factors influencing the staple food of tsetse flies.**—*J. Anim. Ecol.* **27,** 59-69. [Authors' summary modified.] **755**

Gorged *Glossina swynnertoni* and *G. pallidipes* were collected throughout a year, and the gut contents identified serologically.

In all months wart-hogs and bush-pigs were the most important hosts. Active male *G. swynnertoni* averaged about 76% Suidae; resting males about 80%, resting females about 90%, and both sexes of *G. pallidipes* about 94%.

Although previous collections were biased because they consisted of active males only, it is now shown that the conclusions reached are applicable to the population of tsetse as a whole. It is postulated that tsetse have a definite preference for wart-hogs and bush-pigs. Nevertheless, areas are known where kudu, buffalo or hippopotamus appear to be more important to *G. morsitans*.

Lindquist, A. W. (1958). **Systemic insecticides for control of cattle grubs and other livestock insects.**—*Proc. 61st Ann. Meet. U. S. live Stk sanit. Ass., St. Louis,* 1957. pp. 217-224. **756**

Following a disappointing start, research by the author and his co-workers in 1944 paved the way for the recent development of systemic insecticides effective against warble fly larvae. The standard screening technique for promising chemicals involves the feeding of *Callitroga* larvae, *Amblyomma* nymphs and *Stomoxys* adults on g.pigs which have been orally dosed with the drug at the rate of 100 mg./kg. If systemic properties are observed, further tests are performed against *Callitroga* larvae in sheep, goats and cattle, with preliminary field trials on cattle likely to be infected with *Hypoderma*.

Chlorinated hydrocarbons injected s/c into mice kill *Chrysops* and *Aedes,* but tests with cattle gave poor results against the same insects. Mature *Hypoderma* larvae were killed following two s/c injections of dieldrin [*V.B.* **26,** 2001], but early instars were unaffected and it was also found that dieldrin, aldrin and BHC accumulated in the body fat of treated animals.

Oral doses of Dipterex (Bayer L13/59), Diazinon and Chlorthion killed mature encysted warbles but not the early stages [see also *V.B.* **25,** 701]. This is in contrast to the comparative ease of killing young stages of fly larvae when the insecticide is applied directly to the parasite.

In 1954 Dow ET-57 ("Trolene") was found very effective against all stages of warbles when given orally and 90-110 mg./kg. resulted in 85-100% control [see also *V.B.* **28,** 152–4, 1471–2, 1800]. Studies with radioactive (P32 labelled) Dow ET-57 showed that 3 hours after treatment the drug appeared in the blood at the rate of 1 μg.-equivalent/ml. (1 p.p.m.) and that the radioactivity increased up to a maximum of 22·8 μg.-equivalent/ml. at 12 hours. 98% of the insecticide remained unchanged, the other 2% being found as the oxygen analogue. Over 11 days, 86% of the dose was excreted in the urine, mainly between the 6th to 30th hours, mostly occurring as breakdown products. After 14 days omental fat contained 6·9 p.p.m. of unchanged Dow ET-57. Most of the insecticide appears to be excreted within 30 days and the U.S. Dept. of Agriculture recommends a waiting period of 60 days before treated beef cattle are slaughtered (milking stock should not be treated).

Approval was given in September 1957 for the use of Dow ET-57 by private individuals in four States of the U.S.A.

Bayer 21/199 ("Muscatox") acts systemically when applied as an external spray [see also *V.B.* **25,** 3251; **26,** 866]. A single spraying with 0·5-0·75% wash will kill many of the developing *Hypoderma* larvae and protects against *Callitroga* for up to 14 days. A single spraying of a 2% soln. of the radioactive chemical (about 40-60 mg./kg.) was followed by a blood-level rise to only 0·28 μg.-equivalent/ml. after 6 days [see also *V.B.* **28,** 473]. Further work confirmed that the drug was partly absorbed through the skin and slowly excreted. It therefore appears that the ineffectiveness of this chemical when given orally is due to its sensitivity to enzyme or chemical action in the digestive tract.

American Cyanamid compound 12880 [*O,O*-di methyl *S*-(*N*-methyl carbamoylmethyl) phosphorodithioate], given orally at the rate of 10 mg./kg. seems effective against *Hypoderma*

larvae, but further studies are in progress as this compound has a much higher toxicity to mammals than the other two chemicals mentioned above.—W. N. Beesley.

Brown, A. W. A. (1958). **The insecticide-resistance problem. A review of developments in 1956 and 1957.**—*Bull. World Hlth Org.* **18,** 309-321. **757**

During the period under review, resistance was reported for the first time in *Rhipicephalus sanguineus* (to chlordane), *Anopheles subpictus* (to DDT and dieldrin) and *Chrysomyia putoria* (to organic phosphorus compounds). Among other species already known to be resistant to one or more insecticides, resistance to DDT was found in *Boophilus decoloratus* and in *B. microplus*. Current research on the problem was discussed.—R.M.

Schaffer, M. H., Baker, N. F. & Kennedy, P. C. (1958). **Parasitism by *Cheyletiella parasitivorax*. A case report of the infestation in a female dog and its litter.**—*Cornell Vet.* **48,** 440-447. **758**

The infestation was exclusively with *C. parasitivorax*, affording the clearest evidence so far presented that this species can parasitize a mammalian host. Although the puppies must obviously have acquired their infestation from the dam, there was no information as to the primary source. The authors suggested that a simple skin scraping might provide the answer in the case of some of the obscure skin diseases commonly seen in practice.—F.E.W.

Scott, H. G. (1958). **Control of mites on hamsters.**—*J. econ. Ent.* **51,** 412-413. **759**

A laboratory colony of hamsters had become infested with tropical rat mites, *Ornithonyssus* (*Bdellonyssus*) *bacoti* and, as the use of the animals in a physiological experiment debarred topical application of parasiticide, the tray under each cage was painted at intervals with an emulsion containing 2% chlordane. The mite population fell in two weeks from 59 to about 3 mites per animal. The remaining mites were finally eradicated by spraying with 0·3% pyrethrins–1·5% piperonyl butoxide solution each time the cages were washed, also continuing the chlordane treatment. Non-experimental stock were disinfested by dusting with 0·11% lindane–1·91% methoxychlor.

—W. N. Beesley.

Szwabowicz, A., Międzorbrodzki, K. & Schmidt, W. (1958). Toksyczność rozkruszka mącznego *Tyroglyphus farinae* dla zwierząt. III. Doświadczenia na świniach. **[Toxicity of *Tyroglyphus farinae* for animals. III. Experiments in swine.]**—*Méd. vét., Varsovie* **14,** 344-346. [In Polish. Summaries in English and Russian.] **760**

The authors fed *Tyroglyphus farinae* mixed with food to 10 fattening pigs divided into 2 groups; each received 4·4-5 and 8·1-9·3 millions of the mites daily for 90–109 days. A control group of 5 pigs received the same food but without the mites. All pigs remained healthy; they were slaughtered and no abnormality could be seen on P.M. or histological examinations. [See also *V.B.* **28,** 792.]—M. Gitter.

See also abstr. **675** (report, West African Institute for Trypanosomiasis Research); **685-686** (Babesia caballi in Dermacentor ticks in the U.S.S.R.); **709** (tick-borne encephalitis); **909** (report, Nigeria).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Lederman, F. (1958). La distomatose bovine dans les régions du Sud-Kivu. **[Fascioliasis in cattle in the Belgian Congo.]**—*Bull. agric. Congo belge* **7,** 935-968. [Summary in Flemish.] **761**

In the South Kivu district of the Belgian Congo fascioliasis is a serious disease. During an extensive survey it appeared that 85% of cattle over a year in age were affected. Trial of a number of drugs indicated that although carbon tetrachloride (*per os* or subcutaneously in oil) was ineffective, hexachlorethane could be used satisfactorily at rates of 0·125 to 0·175 g./kg. The only practicable means of control is considered to be repeated dosing of stock in an effort to control the output of fluke eggs. ["*Distomum hepaticum*" is indicated as the parasite of first importance in the area. The snails *Physopsis africana, Galba truncatula* and *Bulinus tropicus* are, following Mönnig, regarded as intermediate hosts of *Fasciola gigantica*. Presence or absence of fluke eggs in the faeces is accepted as the criterion of the efficacy of a chemotherapeutic agent.]

—S. Brian Kendall.

Horváth, J. (1958). A májmételykór elleni védekezés módszereiről. **[Control of liver fluke infestation.]** — *Mag. állator. Lapja* **13,** 163-165. [In Hungarian.] **762**

An average live weight of 415 kg. in the slaughter-cattle population of a district and a total milk yield of 152,100 litres in the central village of this district were recorded in Hungary

from January 1954 to October 1957, against the figures of 336 kg. average live weight and 40,500 litres total milk yield during the year 1953. The author attributes this increase to the thorough and continuous application of the routine measures for the control of liver fluke infestation from January 1954 in this district: treatment of infected animals, systematic control of *Limnaea truncatula* by treating their habitats with copper sulphate, drainage of wet pastures and rotational grazing. He admits, however, that 40-50% of this difference could be attributed to the considerable shortage of feeding stuffs during 1953.—A. SEBESTENY.

EHRLICH, I., LUI, A. & WINTERHALTER, M. (1958). Über die fasciolocide und ovicide Wirkung des Tetrachlorkohlenstoffs (CCl_4) bei Schafen. [**Action of carbon tetrachloride on adults and eggs of *Fasciola hepatica* in sheep.**] — *Dtsch. tierärztl. Wschr.* **65,** 323-326. [Summary in English.] **763**

20 fluke-infested sheep were each injected subcutaneously with 5 ml. of a mixture of carbon tetrachloride and liquid paraffin in the proportions 3 : 1. Groups of sheep were slaughtered 24, 36, 48 and 72 hours after treatment.

All adult *F. hepatica* were dead in all of the 20 sheep except two which were slaughtered at 36 and 72 hours respectively and in which only live flukes remained in dilated bile ducts. The average number of *Fasciola* eggs which remained viable in the gall bladder and bile ducts was about 3% (maximum 5·68%) of the total.

Concomitant infections of *Dicrocoelium dendriticum* and echinococcus cysts were unaffected by carbon tetrachloride.

—H. SCOTT MCTAGGART.

DINNIK, J. A. (1958). **Identification of liver fluke and stomach fluke eggs recovered from faeces of infested animals.**—*Bull. epiz. Dis. Afr.* **6,** 135-139. [In French pp. 185-189.] **764**

A comparative morphological study of the eggs of *Fasciola* spp. and of Paramphistomidae in Africa was carried out to ascertain the value of faeces examination in the differential diagnosis of fluke infestation of domestic ruminants.

In describing a simple sedimentation method for concentrating fluke eggs D. states that the faecal suspension is "shaken vigorously for twenty minutes and then allowed to settle". It seems possible that this should read "shaken vigorously and then allowed to settle for twenty minutes" since it is to be done repeatedly.

Fasciola eggs are characterized by their yellowish- or greenish-brown colour and by having the embryo near one pole. The two species described are distinguished by their size, *F. gigantica* eggs being 150 to 190 μ by 79 to 100 μ and *F. hepatica* eggs 124 to 150 μ by 72 to 88 μ.

Of the 12 species of paramphistome eggs examined all were distinguishable from *Fasciola* eggs by being either much paler in colour or colourless and by having a central embryo. Only three species were individually distinguishable.

Paramphistomum microbothrium eggs are slightly yellow and measure 160 to 200 μ by 80 to 100 μ.

P. sukari eggs are very similar, measuring 140 to 165 μ by 71 to 92 μ. At least 50 eggs should be measured to determine their range of variation before deciding whether the animal is infested with either of these two species or both.

The eggs of *Calicophoron raja* measure 137 to 167 μ by 69 to 88 μ and contain an embryo in the late morula stage surrounded by clearly outlined yolk cells. The eggs of the other paramphistome species are 115 to 150 μ long. The distinguishing features of *Fasciola, Paramphistomum* and *Calicophoron* eggs are illustrated by line drawings.

—H. SCOTT MCTAGGART.

PESIGAN, T. P. & OTHERS. (1958). **Studies on *Schistosoma japonicum* infection in the Philippines. I. General considerations and epidemiology. 2. The molluscan host. 3. Preliminary control experiments.**—*Bull. World Hlth Org.* **18,** 345-455; 481-578; **19,** 223-261. **765**

Cross-infection experiments with *S. japonicum* from man, dog, pig, cow and rat revealed no differences. Incidence was studied in 2,900 human beings and 1,200 animals. The percentage found infected was as follows: man 48, dog 18, pig 13, buffalo 1·5, cow 38, goat 1·4, rat 23%. Dogs were the most important source of infection for man, with cattle the next.

The vector was *Oncomelania quadrasi*, a snail apparently confined to the Philippine Islands. The biology and ecology of the snail were studied in detail.

Because the terrain was unsuitable for the application of molluscicides, the main control measures were improved drainage and improved sanitation. The authors made no direct reference to the control of infection in animals.

—R.M.

SENTERFIT, L. B. (1958). **Immobilization of the miracidia of *Schistosoma mansoni* by immune sera. I. The nature of the reaction as studied in hamster sera. II. The occurrence of the**

antibody during the course of schistosomiasis. —*J. Hyg., Camb.* **68,** 140-147 & 148-155. [Author's summary modified.] **766**

The sera of hamsters, monkeys and human beings infected with *S. mansoni* were capable of immobilizing the miracidia of the parasite.

Comparisons of the time of appearance of the miracidial immobilization reaction and two other *in vitro* reactions (cercarial agglutination and circumoval precipitate) in the serum of experimentally infected monkeys showed that these 3 reactions became positive at about the same time.

The immobilizing antibody was at a high level during the acute infection and at a relatively lower level, or completely absent, in chronic infections of both monkey and man. Although infection of man and rabbits by *Trichinella spiralis* was associated with antibodies to miracidia, various other infections were not.

PITCHFORD, R. J. (1958). **Animal reservoirs of human bilharziasis in the Eastern Transvaal.** —*Bull. World Hlth Org.* **18,** 1080-1081. **767**

Adult schistosomes were found in the mesenteric veins in 246 of 346 cattle, 8 of 12 sheep and 2 of 4 goats. In addition lesions and ova were found in the bladder of 12 cattle: the ova were identified as *S. haematobium*.—R.M.

DANAILOV, I. & GENOV, I. (1958). **[Avitellina infestation of sheep in Bulgaria.]**—*Vet. Sbir.* **55,** No. 5. pp. 14-16. [In Bulgarian.] **768**

The death of 147 sheep in 15 flocks between August and December was attributed to infestation with *Avitellina centripunctata*. Symptoms were incoordination of movement: death occurred within an hour after symptoms first appeared. Of 205 cestodes recovered from 22 carcasses, 182 were *A. centripunctuta* and 23 were *Thysaniezia giardi*. Various anthelmintics were tried, and tartar emetic was the most effective.—R.M.

GEMMELL, M. A. (1958). **Impressions of the cestode problems of domestic animals in New Zealand, with special reference to the control of hydatid disease.** — *N. Z. vet. J.* **6,** 106-110. **769**

G. has drawn certain conclusions regarding the distribution of cestodes in domestic and wild animals in New Zealand by comparing climatic conditions with those in Australia where the effect of climate on distribution has been more closely studied. In Australia *Echinococcus granulosus* is absent from areas where rainfall is low or temperature high for five or more months of the year. On the other hand *Taenia hydatigena* and *T. ovis* are widely distributed in Australia, their survival being relatively unaffected by climatic conditions. A series of bioclimatographs demonstrates that climatic conditions are suitable over probably most of New Zealand for the survival of *E. granulosus*. The author discusses the problems presented by the following facts. Although *E. granulosus* and *T. hydatigena* have the same life cycle, about 50% of lambs' livers are affected with *Cysticercus tenuicollis*, whereas only about 10% are affected with echinococcus cysts. The latter figure increases with each year of age to reach about 50% in sheep five years old or older. The number of lambs' livers affected by cysts has not been greatly reduced by regular dosing every three months with arecoline hydrobromide, over a period of eight years, of 80% of dogs in a given area while they still had access to raw sheep offal.

Despite legislation and educational propaganda (since 1940) against feeding of raw sheep offal to dogs, a high proportion of dogs are still infested with *T. hydatigena* and/or *E. granulosus* and there is apparently no decrease in the incidence of these parasites in sheep.

—H. SCOTT MCTAGGART.

GUILHON, J. & GRABER, M. (1958). Recherches sur l'activité anthelminthique du phloroglucinate de diéthylène-diamine sur les cestodes du mouton. **[Anthelmintic action of piperazine phloroglucinate on cestodes in sheep.]**—*Bull. Acad. vét. Fr.* **31,** 311-314. Discussion: p. 314. **770**

Five groups of two or three sheep, each naturally infested with *Moniezia expansa, Avitellina centripunctata* and *Stilesia globipunctata* were treated with a single dose of piperazine phloroglucinate ranging from 100 to 250 mg./kg. Five untreated sheep were controls.

Seven days after treatment all were slaughtered and the average weight of each species of tapeworm in each group of sheep was compared with the average found in the control group.

The activity of the drug was uniform throughout the dose-range employed, being highly effective against *Moniezia* but much less so against *Avitellina* and *Stilesia*.

—H. SCOTT MCTAGGART.

ABDOU, A. H. (1958). **Studies on the development of *Davainea proglottina* in the intermediate host.**—*J. Parasit.* **44,** 484-487. [Author's summary modified.] **771**

Eleven species of slugs were capable of acting as intermediate hosts of the fowl tape-

worm, *D. proglottina*. Four of these species were bred in the laboratory and were fed on fresh segments of the cestode. The development of the cysticercoid was as follows. The hexacanth embryo hatches in the gut of the slug and penetrates the gut wall. The larva grows rapidly with the formation of an interior space, the primitive lacuna. One pole of the cyst differentiates to form the scolex which is withdrawn into the cavity of the cyst before maturation. A rudimentary caudal appendage was observed on the cysticercoids.

The rate of development of cysticercoids is dependent on the environmental temperature.

ZIMMERMANN, W. J. & SCHWARTE, L. H. (1958). **Trichiniasis in dogs and cats of Iowa.** — *J. Parasit.* **44,** 520-522. [Authors' summary modified.] **772**

From March 1954 to December 1957, 521 dogs and 50 cats were examined for *Trichinella spiralis*. 10% of the dogs and 6% of the cats harboured the larvae. Infections were generally light, although a few heavier infections were found. The incidence was higher in older animals.

I. SKALINSKII, E. I. (1957). **[Toxic action of larvae of *Strongylus vulgaris* on horses.]** — *Trud. nauchno-kontrol. Inst. vet. Preparatov* **7,** 310-317. [In Russian.] **773**

II. SKALINSKII, E. I. (1957). **[Pathology of experimental and spontaneous *Strongylus vulgaris* infestation in horses.]** — *Ibid.* 318-327. [In Russian.] **774**

I. When larvae of this nematode died in horses, the products of decomposition could have a toxic action which gave rise to signs of colic. Toxin was prepared in dilutions of 1:100 and 1:5,000 from larvae from aneurysms in slaughtered horses. Colic was reproduced in a mare aged 8 years by i/v inj. of 7 ml. of 1:5,000 toxin.

II. Post-mortem findings in 13 experimentally infected horses and 40 spontaneous cases were described and illustrated [12 plates of photographs or photomicrographs], with special attention to lesions in arteries and in the nervous system.—R.M.

SOULSBY, E. J. L. (1958). **Studies on the heterophile antibodies associated with helminth infections. III. Heterophile antibody in *Oesophagostomum dentatum* infection in pigs.**—*J. comp. Path.* **68,** 380-387. [Author's conclusions modified.] **775**

Heterophile antibodies of the Forssman type are stimulated in rabbits and pigs by *Ascaris lumbricoides* and in the pig by *Oesophagostomum dentatum* infection. No protective mechanism can be ascribed to such antibodies, but in the rabbit the Forssman antibody induced by *A. lumbricoides* infection can be used as a "marker" to detect slight changes in the antibody response. In pigs, the natural heterophile antibody titres undergo substantial variations. Infections with *A. lumbricoides* and with *O. dentatum* are thought to play a part in modifying these levels.

WHITLOCK, J. H. (1958). **The inheritance of resistance to trichostrongylidosis in sheep. I. Demonstration of the validity of the phenomena.**—*Cornell Vet.* **48,** 127-133. **776**

WHITLOCK, J. H. & MADSEN, H. (1958). **The inheritance of resistance to trichostrongylidosis in sheep. II. Observations on the genetic mechanism in trichostrongylidosis.** — *Ibid.* 134-145. **777**

MADSEN, H. & WHITLOCK, J. H. (1958). **The inheritance of resistance to trichostrongylidosis in sheep. III. Preliminary studies using a gastric pouch.**—*Ibid.* 145-164. **778**

I. Haematocrit readings and worm egg counts of almost 500 sheep are presented which confirm previous work [*V.B.* **26,** 2049 & 2340] in which the existence of an inherited resistance to trichostrongylidosis was reported.

Evidence is also presented that it is possible by selective breeding to build up populations which are genetically resistant or susceptible to trichostrongylidosis.

II. The emergence, following random allocation of ewes, of predominantly resistant offspring from one particular ram (Violet) suggested that a dominant genetic factor was involved. No conclusive evidence has yet been found that the "Violet factor" is other than a simple dominant whose allele in the homozygous condition represents susceptibility.

III. *Haemonchus contortus* and *Ostertagia circumcincta* were reared to maturity in gastric pouches in sheep, indicating that their survival and development is independent of the presence of ingesta. "Self-cure" was not observed to occur in the pouches.

The development of cuticular bosses and distorted spicules in some specimens of *H. contortus* in the pouches suggests that this environment is less favourable than the intact abomasum and casts doubt upon the validity of *H. santomei* and *H. lunatus*.

The resistance of sheep to trichostrongylidosis, as determined by pasture exposure and by subsequent infection of the functioning aboma-

sum, corresponded completely with the infections that could be established in the gastric pouches.

It is believed that the anthelmintic action of the "Violet factor" is likely to be contained in the gastric mucosa and its immediate vicinity.

—H. Scott McTaggart.

Allen, R. W. & Becklund, W. W. (1958). *Cooperia mcmasteri* **and** *Cooperia surnabada* **in the United States.** — *J. Parasit.* **44,** 503-506. **779**

The authors discussed the differences between these two species of nematode; both existed in cattle in the U.S.A.—R.M.

Weber, T. B. (1958). **The complement-fixing antibody response of cattle infected or exposed to reinfection with** *Dictyocaulus viviparus*.—*Amer. J. vet. Res.* **19,** 338-344. **780**

Antigens for the c.f. test were prepared by various means from eggs, larvae or adult lungworms: only those prepared by extraction of adult worms with physiological saline gave consistent results. Sera from 7 uninfected and 20 infected cattle were tested. The complement-fixation responses of 3 calves infected for the first time did not differ from those of 3 calves infected for the second time. C.f. antibodies first appeared in serum 12 days after infection and reached their highest concentration about 4 days later; this peak lasted for about 48 days. The behaviour of c.f. tests did not appear to depend on age of the animal, size of infective dose of larvae, or severity of infection. [See also *V.B.* **25,** 2885.]—R.M.

Parker, W. H. & Roberts, H. E. (1958). **Observations on experimental parasitic bronchitis in calves and the response to diethylcarbamazine.**—*J. comp. Path.* **68,** 402-410. [Authors' conclusions modified.] **781**

Diethylcarbamazine, 10 mg./lb. body wt. daily for five days commencing 14 days after infection, effectively terminated a 'moderate' lungworm infestation. Intramuscular injection was only slightly better than oral dosage. Clinical response commenced immediately and weight gain improved over the period corresponding to the patent period. Reaction to challenge on the 44th day suggested that immunity in treated calves was less than in animals which had had patent infection. Persisting lesions were present in both treated and untreated calves on the 82nd day.

Rogers, W. P. (1958). **Physiology of the hatching of eggs of** *Ascaris lumbricoides*. — *Nature, Lond.* **181,** 1410-1411. **782**

Eggs appeared to hatch in two ways. Usually the larva burst through at a place where localized hydrolysis of the shell had occurred; more rarely, hydrolysis of the whole of the hard shell took place. Experiments *in vitro* showed that (1) Dissolved gaseous carbon dioxide at low redox potentials stimulated the production of a hatching fluid containing an esterase, chitinase, and possibly a protease: (2) the esterase altered the vitelline membrane of the eggs so that the chitinase, and possibly the protease, hydrolysed the hard shell either generally or in a restricted area: (3) fracture of the membrane finally released the larva.—E.V.L.

Prost, M. (1958). Badania nad zastosowaniem roślinnych fermentów proteolitycznych przy glistnicy u kur. **[Proteolytic enzymes against** *Ascaridia galli* **infestation in fowls.]** — *Méd. vét., Varsovie* **14,** 326-329. [In Polish. Summaries in English and Russian.] **783**

Two preparations were used, "Vermizym" and "Nematolyt". *In vitro* they both exerted a strong digestive action on the tissues of *Ascaridia galli* which were completely digested after 24 hours. 111 hens artificially infected with *A. galli* were divided into 6 groups, treated with the above preparations, killed 5-6 days later and examined for the presence of worms. 20-60% of the hens were found free from worms and although the drugs were markedly non-toxic P. is of the opinion that their efficacy is too low for general use.—M. Gitter.

See also abstr. **728** (effect of Ascaris suum migration on course of swine influenza); **908** (report, Union of South Africa); **909** (report, Nigeria).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Cretzeanu, C., Pastea, Z. & May, I. (1958). Observations sur un cas de réticulomatose cutanée chez une chienne. **[Cutaneous reticulomata in a bitch.]**—*Rec. Méd. vét.* **134,** 543-557. [Summaries in English and Spanish.] **784**

A six-month-old Alsatian bitch showed multiple firm, bosselated superficial and deep nodules adherent to the skin or subcutis of the head, trunk and limbs, wasting, leucocytosis with a shift to the left, and a moderate asymmetrical enlargement of lymph nodes. Biopsy of skin tumour and lymph node revealed immature reticulum cells. At P.M. examination

similar nodules were found in lungs, spleen and intestine. For reasons given, the diagnosis of reticulosarcoma was preferred to that of leucosis.
—E. Cotchin.

Ressang, A. A., Titus, I., Koerjana, Sikar & Nabib, R. (1958). **Venereal sarcoma in the dog.**—*Commun. vet., Bogor* **2,** 1-19. [In English. Summaries in French and Indonesian. Authors' abst. modified.] **785**

Venereal sarcoma in dogs is very common in Indonesia. Contrary to the opinion of most French investigators who consider this tumour to be a specific granuloma caused by a probable infective agent, the authors consider it to be a true neoplasm belonging to the group of transmissible tumours. No infective causal agent (viral, bacterial, fungal) could be proved by them.

Dahme, E. & Weiss, E. (1958). Zur Systematik der Mammatumoren des Hundes. **[Classification of mammary neoplasms in dogs.]** — *Dtsch. tierärztl. Wschr.* **65,** 458-461. [Summary in English.] **786**

In the 3-year period, 1955-57, 300 mammary tumours from dogs were examined at Munich, as well as 4 from cats (all adenocarcinomas) and one from a mare (fibrosarcoma). Of the 300 canine tumours, 127 were classified as mixed (72 being histologically malignant, 3 showing metastases), 144 as epithelial tumours (100 malignant, 15 with metastases), 56 as mesenchymal (49 malignant, 4 with metastases), one as a cystic tumour, and 2 (or 3) as tumours in, but not of, the mammary gland. [The histological basis of the classification used is not stated in detail.] The importance of the non-epithelial component of the mammary gland of the bitch in neoplastic changes is stressed, and the unnatural sexual life of the household pet is again suggested as a causal factor.
—E. Cotchin.

Peacock, P. R. (1958). **Avian carcinogenesis.** —*Brit. med. Bull.* **14,** 121-123. **787**

P. discusses briefly the role of viruses and chemical carcinogens in producing fowl tumours. It is suggested that most fowl tumours resemble those of mammals in their characteristics, and are not transmissible by cell-free filtrates, as is usually possible with those tumours that are transplantable. Chemical carcinogens have been used successfully in experiments with fowls, *e.g.* induction of sarcoma, not transmissible by cell-free filtrates, by intramuscular injection of carcinogenic polycyclic hydrocarbons. Epidermal squamous-cell carcinoma, which occurs spontaneously, has not been produced by tar or hydrocarbons, perhaps because of the absence of sebaceous glands in fowl skin. The possible role of hormonal factors is indicated by the development of ovarian carcinoma in fowls kept in a constant environment throughout life. Local trauma might perhaps be significant in producing local tumours.
—E. Cotchin.

Harris, R. J. C. & Simons, P. J. (1958). **Nature of the antigens responsible for the acquired tolerance of turkeys to Rous sarcoma agent.**—*Nature, Lond.* **181,** 1485-1486. **788**

The antigen was a polysaccharide very similar to, if not identical with, the substance of human blood group A.—R.M.

Thoonen, J. & Hoorens, J. (1958). Leucose bij het varken. **[Leucosis in pigs.]**—*Vlaams diergeneesk. Tijdschr.* **27,** 229-239. [In Flemish. Summaries in English, French and German. English summary modified.] **789**

The authors discussed the literature about leucosis in the pig and described lymphoid leucosis in two slaughter pigs, one of which had unusually extensive lesions in lymph nodes, stomach, intestines, liver, kidneys, myocardium, adrenal glands, ovaries and cranium.

Lemaire, G. (1957). La N désacétyl thiocolchicine en pathologie cancéreuse canine. **[Treatment of leucosis in dogs with N-desacetylthiocolchicine.]**—*Thesis, Paris* (*Alfort*) pp. 68. **790**

This thesis gives details of work previously reported by Brion & Fontaine [*V.B.* **28,** 1144].
—R.M.

Ishitani, R. (1957). **[Studies on the avian leucosis complex. IV, V & VI. Pathological studies, especially cytological investigations on avian erythroleucosis. VII. Pathological studies, especially histopathological investigations, on avian erythroleucosis.]**—*Bull. Nat. Inst. Anim. Hlth, Tokyo* No. 32. pp. 261-295 & 305-314. [In Japanese. English summaries pp. 296-304 & 315-321.] **791**

The author studied peripheral blood and bone marrow from 75 experimental and 9 spontaneous cases of erythroleucosis [see *V.B.* **26,** 1339; **28,** 185]. Cells of the thrombocyte, myelocyte and lymphocyte series were described. Three principal types of change encountered were erythroblastosis, mixed erythroblastosis and thromboblastosis, and mixed erythroblastosis, thromboblastosis and myelosis.

The main histological changes in tissues and organs were hyperplasia of immature blood cells, activation of the reticulo-endothelial system and degeneration and necrosis in liver and kidney.—R.M.

Benton, W. J. & Cover, M. S. (1957). **The increased incidence of visceral lymphomatosis in broiler and replacement birds.** — *Avian Diseases* **1**, 320-327. **792**

Unusually high incidence of visceral lymphomatosis in two flocks was reported. Severe muscular lesions were common in one outbreak.—R.M.

NUTRITIONAL AND METABOLIC DISORDERS

Reid, C. S. W. (1958). **Bloat in cattle. VIII. Prevention by pasture spraying with anti-foaming agents; preliminary experiments with non-lactating dairy cows and sheep.**—*N. Z. J. agric. Res.* **1**, 349-363. Appendix [Brougham, R. W., Glenday, A. C. & Reid, C. S. W.] pp. 363-364. [Author's summary modified.] **793**

Spraying pasture with emulsified peanut oil, emulsified tallow, cream, or "Avlinox" (a ricinoleic acid derivative), provided a high degree of protection from bloat to non-lactating, monozygotic twin cows. The application rates for a two-hour grazing period (equivalent to half the daily intake) were 25–30 ml. oil, 30 g. tallow, 15–60 g. butter-fat or 10 ml. of Avlinox per cow.

Sprays containing a polymerized dimethyl silicone were ineffective.

Two methods of application of emulsified peanut oil were used: (a) strip spraying, where the oil was applied to a narrow strip which was fed off before access was allowed to the unsprayed remainder; (b) total ration spraying where the oil was applied evenly over the whole ration, which was grazed at the one time. Both methods gave good control of bloat.

Moderate rain partly washed off sprays containing Avlinox or cream.

Herbage strips heavily sprayed with emulsified peanut oil were mildly repellent to some cows, while herbage sprayed with Avlinox was mildly repellent to all. Emulsified peanut oil, emulsified tallow, cream, and silicone had no obvious effect on palatability when sprayed over the whole ration.

In a single trial with sheep, Avlinox sprayed on the pasture gave protection from bloat for several hours.

Visible but apparently temporary damage to the herbage was caused by the heavier application of emulsified peanut oil in strip spraying. Little or no damage was caused by the oil or any of the remaining agents when sprayed over the whole ration.

Tölgyesi, G. (1958). A habos-erjedéses felfúvódás esetén alkalmazható gyógyszerekről. [**Treatment of frothy bloat.**]—*Mag. állator. Lapja* **13**, 148-151. [In Hungarian. Summaries in English and Russian.] **794**

T. discussed the physical and chemical aspects of frothy bloat of ruminants, and tabulated the results of his experiments *in vitro* on the froth-breaking effects of 54 preparations and substances on artificially made froths of saponin, protein, clover-seed, lucerne-seed, potato, soap and rumen content. Based on his results, he suggested the use in cattle of equal volumes of ethyl alcohol and normal butyl-alcohol injected into the rumen in a dose of 20-30 ml.

—A. Sebesteny.

McGinnis, J., Merrill, L. H., Fry, R. E. & Jensen, L. S. (1958). **Use-history of antibiotics as related to their efficacy in promoting growth of turkeys.**—*Poult. Sci.* **37**, 810-813. [Authors' summary.] **795**

Results of three experiments with turkey poults are presented. Only a slight improvement in growth was obtained by procaine penicillin supplementation to practical-type rations. Some other widely used antibiotics also failed to improve growth significantly. In contrast, two new antibiotics (oleandomycin phosphate and erythromycin thiocyanate) significantly improved growth in each experiment.

Taylor, R. J. F., Worden, A. N. & Waterhouse, C. E. (1958). **The diet of sledge dogs.** —*Vet. Rec.* **70**, 268-269. **796**

Pemmican, a concentrated beef product long used for feeding sledge dogs, has been shown to be an inadequate diet. The dogs lose weight, have almost constant diarrhoea and develop sore gums and palatal ulcers. Investigations which included studies with dogs in metabolism cages have enabled a better diet to be devised by increasing the proportion of carbohydrate at the expense of protein and fat.

—E. J. Castle.

KRÜGER, L. & MEYER, F. (1958). Über Versuche mit hohen Gaben an Lebertranemulsion. **[Experiments with high doses of cod-liver oil.]** — *Dtsch. tierärztl. Wschr.* **65,** 326-329. [Summary in English.] **797**

Cod-liver oil emulsion was added to the food of pigs throughout the 3-month fattening period at a daily dosage of 60 g. a pig, and to the food of fattening calves for 3–10 months at a daily dosage of 90 g. It had no adverse action on the animals and increased the growth rate. There was no evidence of liver dystrophy. —R.M.

KORST, D. R. & BETHELL, F. H. (1958). **Erythrocyte radioiron uptake in the rat and the effects of cobalt.**—*J. Lab. clin. Med.* **52,** 356-363. [Authors' summary modified.] **798**

The ferrokinetics of the rat provide a reliable laboratory method of studying the effects on the rate of erythropoiesis and bone marrow function.

Cobalt administration increased radioiron utilization in normal and hypophysectomized rats. The action of cobalt does not appear to be altered by splenectomy or significantly modified by administration of cysteine or histidine.

The standard deviation of the mean results was less in the hypophysectomized than in the normal group, and the proportional response to erythropoietic stimulation as measured by iron tracer utilization was greater in the hypophysectomized than in the normal group.

BROWN, E. B., JR., DUBACH, R. & MOORE, C. V. (1958). **Studies in iron transportation and metabolism. XI. Critical analysis of mucosal block by large doses of inorganic iron in human subjects.**—*J. Lab. clin. Med.* **52,** 335-355. [Abst. from authors' summary.] **799**

Block to iron absorption occurs when a large dose of an iron salt has been administered several hours before a second "test" dose. This phenomenon is unphysiological and cannot be equated with the still undiscovered mechanism controlling iron absorption under natural conditions. Experimental evidence does not justify the current use of the term "mucosal block" to describe the physiological regulation of iron absorption. Until the factors which control iron absorption are more clearly understood, the use of the phrase "mucosal block" should be abandoned.

JENSEN, R., MAAG, D. D. & FLINT, J. C. (1958). **Enzootic ataxia from copper deficiency in sheep in Colorado.**—*J. Amer. vet. med. Ass.* **133,** 336-340. [Authors' summary modified.] **800**

Enzootic ataxia occurred in two flocks of sheep on adjacent farms. The clinical signs were progressive locomotor incoordination beginning in the hind-limbs, progressing to the fore-limbs and terminating in paralysis. Pathological changes were spinal cord demyelination of the dorsolateral, spinocerebellar, and ventral corticospinal tracts, and neuronal degeneration and necrosis in the spinal cord, medulla oblongata, and thalamus.

Chemical analysis of dried liver showed a mean copper content of 12·7 p.p.m. and molybdenum 50·7 p.p.m. for lambs with enzootic ataxia, as compared with Cu 214·5 p.p.m. and Mo 20·2 p.p.m. for normal lambs.

O'DELL, B. L., MORRIS, E. R. & REGAN, W. O. (1958). **Effect of phosphorus on magnesium requirement.**—*Fed. Proc.* **17,** 487. **801**

Rats and g.pigs were fed diets deficient in magnesium and containing varying quantities of calcium and phosphorus. A high intake of phosphorus accentuated symptoms as much as high levels of calcium. In g.pigs soft tissue calcification was the most significant symptom. A high phosphorus intake aggravated several of the gross symptoms.—D. S. PAPWORTH.

MACINTYRE, I. & DAVIDSSON, D. (1958). **The production of secondary potassium depletion, sodium retention, nephrocalcinosis and hypercalcaemia by magnesium deficiency.** — *Biochem. J.* **70,** 456-462. [Authors' summary modified.] **802**

The effects of dietary magnesium deficiency were studied in rats. The rats grew little or lost weight and after 12 days developed peripheral vasodilatation and oedema which lasted for a further 7–10 days. There was a progressive fall in magnesium content in skeletal muscle. The mean contents of muscle sodium and chloride increased in the deficient group. Magnesium and potassium concentrations were unaltered in brain, liver and kidney. The calcium contents of muscle, brain and liver did not differ significantly in the two groups but there was a mean increase in the kidneys of the deficient group. Within 3 weeks the magnesium conc. in the femur had fallen to about half that of the control group. The plasma magnesium conc. fell from the control value of 1·7 to about 0·4 m-equiv./kg. within 3 weeks and thereafter increased slightly. Plasma sodium was slightly increased in the deficient group; the mean calcium conc. in the deficient and control groups was 6·4 and 5·3 m-equiv./kg. respectively.

Nephrocalcinosis occurred only when hypercalcaemia was also present. The hypothesis is advanced that the potassium deficiency was due to impaired ion transport secondary to an effect of magnesium deficiency on mitochondrial function.

AFFLECK, H. (1958). **Iodine deficiency in Southern Rhodesia.**—*Rhod. agric. J.* **55,** 439-440. [Author's summary modified.] **803**

Iodine deficiency symptoms are reported in Southern Rhodesia in horses, cattle, pigs, sheep, goats and man. Some observations on occurrence are given.

NESHEIM, M. C. & SCOTT, M. L. (1958). **Studies on the nutritive effects of selenium for chicks.** —*J. Nutr.* **65,** 601-618. [Authors' summary modified.] **804**

Selenium was effective in preventing exudative diathesis when chicks were fed a diet containing isolated soya bean protein as a source of protein as well as on a diet containing torula yeast.

Injected selenium was effective in treating chicks already affected with exudative diathesis.

Selenium reduced the incidence of muscular dystrophy in chicks fed diets low in methionine and vitamin E but did not completely prevent it.

Petroleum ether-insoluble residues of certain natural feeding stuffs were relatively rich sources of a factor, presumably a selenium compound, which prevented exudative diathesis in chicks.

O'DELL, B. L., NEWBERNE, P. M. & SAVAGE, J. E. (1958). **Significance of dietary zinc for the growing chicken.**—*J. Nutr.* **65,** 503-518. [Authors' summary modified.] **805**

Chicks were maintained on a zinc-deficient diet (15 p.p.m.) for 4 or 6 weeks. In some trials the chicks were kept in galvanized batteries and they developed mild sympoms of zinc deficiency (slow growth, shortening and thickening of long bones, "frizzled" feathers, abnormal respiration, unsteady gait). In other trials the batteries were lacquered and the chicks developed severe deficiency symptoms, with keratosis of the skin and an increased packed red cell volume; microscopically there was evidence of parakeratosis in the oesophagus and poor calcification of bone.

The zinc requirement of chicks fed 1·6% of calcium, 0·7% of phosphorus and maintained in lacquered batteries was estimated to be 35 p.p.m.

SMITH, R. H. (1958). **Calcium and magnesium metabolism in calves. II. Effect of dietary vitamin D and ultraviolet irradiation on milk-fed calves.** — *Biochem. J.* **70,** 201-205. [Author's summary modified.] **806**

The addition of 300–400 i.u. of vitamin D_3 per day to the diet of milk-fed calves reduced the rate of decrease in calcium utilization as the calves got older and prevented the plasma-calcium level from falling when the plasma-magnesium level fell.

The addition of 70,000 i.u. of vitamin D_3 per day or irradiation of the calves with u.v. light greatly improved the utilization of calcium both in calves previously receiving no vitamin D and in those receiving 300–400 i.u. of vitamin D_3/day.

The mean faecal excretion of magnesium increased from 32% of the dietary magnesium at about 3 weeks of age to 86% at about 16 weeks of age, after which it did not change greatly. Neither the addition of vitamin D to the diet nor irradiation of the calves with u.v. light had any appreciable effect on this excretion.

ALTEN, F., ROSENBERGER, G. & WELTE, E. (1958). Zur Frage der Ursache und des Wesens der Weidetetanie. **[The cause and nature of grass tetany in cattle.]** — *Zbl. VetMed.* **5,** 201-230. [Summaries in English, French and Spanish.] **807**

The results indicate that the factors leading to tetany are non-specific, but overfeeding with minerals may well be the uncoupling factor. The factors can be either endogenous or exogenous (change of food; transport and loading conditions), especially in animals with maximum productivity. A study of mineral changes in the blood serum indicated that K, Na, Ca and Mg varied individually to such an extent in the serum levels that no true general picture of their influence was obtained. The blood picture was not appreciably affected by the minerals, whereas increase or decrease in leucocytes was observed following nervous excitation or stress.

—E. S. FOUNTAIN.

BALLOU, J. E. (1958). **Effects of age and mode of ingestion on absorption of plutonium.** — *Proc. Soc. exp. Biol., N.Y.* **98,** 726-727. [Author's summary modified.] **808**

The effect of age on gastro-intestinal absorption of plutonium was determined for rats from 1 to 84 days of age. Absorption for day-old rats was 85 times that for the adult. This dropped to near adult levels in 21-day-old weanlings. Plutonium distribution in the 7-day-

old rat was essentially the same as that in the adult. Absorption of plutonium applied to the tongue or fed in drinking water did not differ significantly from absorption after feeding by stomach-tube.

KOVAL'SKII, V. V. (1958). **[Biogeochemical zones and endemics of farm animals.]** — *Vestnik sel'skokhoz. Nauk* **30,** No. 9. pp. 50-58. [In Russian. Summaries in English and German.] **809**

K. divided the U.S.S.R. into zones of differing mineral composition of soil (illustrated by a map) and discussed the occurrence of diseases of livestock caused by excess or deficiency of minerals in these zones.—R.M.

FORBES, R. M. & DRAPER, H. H. (1958). **Production and study of vitamin E deficiency in the baby pig.**—*J. Nutr.* **65,** 535-545. **810**

Signs of deficiency in 37 piglets fed a diet low in vitamin E developed only if cod-liver oil was added to the diet. No abnormalities were detected in the electrocardiogram of affected pigs. Pentose was not present in urine, although this has been reported in human muscular dystrophy. The erythrocytes of deficient piglets unlike those of vitamin E-deficient rats were not haemolysed by dialuric acid.—R.M.

GREENE, R., FARRAN, H. & GLASCOCK, R. F. (1958). **Goitrogens in milk.** — *J. Endocrin.* **17,** 272-279. [Authors' summary modified.] **811**

English kale, commonly used as a winter fodder for cows, contains a substance which causes epithelial hyperplasia in the thyroid of rabbits. The milk of cows fed either on kale or on hay contains a substance which temporarily suppresses the uptake of radio-iodine by the human thyroid. The 'goitrogenic' effect of 'hay milk' is transient, and there is no evidence that it is clinically significant. That of 'kale milk', even if it is significant in fresh milk, is absent from deep-frozen milk. Further experiments are in progress to determine the goitrogenic properties, if any, of fresh kale milk.

KRONFELD, D. S. (1958). **The fetal drain of hexose in ovine pregnancy toxemia.**—*Cornell Vet.* **48,** 394-404. [Author's summary modified.] **812**

The foetal drain of hexose during advanced pregnancy in sheep was calculated to be about 32 g. per day. This was one-third or more of the amount of glucose which might be added daily to the blood of a non-pregnant sheep. Metabolic adaptations were discussed which tend to accommodate this drain during normal pregnancy. Ovine pregnancy toxaemia, at least in an early stage of development, may be regarded as a hypoglycaemic encephalopathy resulting from an inability to compensate for the foetal drain of hexose.

DISEASES, GENERAL

HAYWARD, A. H. (1958). **Report to the government of Afghanistan on the control of animal diseases.** pp. 30. Rome: Food and Agriculture Organization of the United Nations. (FAO Report No. 844.) **813**

The report, based on a three-year tour of duty, gives a very useful account of the diseases of livestock which are of importance in Afghanistan and makes a recommendation for development of the veterinary services.

The country is free from rinderpest but danger of infection of the border areas is still present. "Spirotrypan forte", a German proprietary drug, is stated to have given good results in treatment of anaplasmosis in imported cattle; it has reduced mortality from 80% to 20%.

GOŁĘBIOWSKI, S. (1958). Choroby zakaźne zwierząt rzeźnych stwierdzone w rzeźni w Łodzi. **[Infectious diseases in slaughter animals at the Lódź abattoir.]** — *Méd. vét., Varsovie* **14,** 339-343. [In Polish. Summaries in English and Russian.] **814**

During the period 1952–57, animals slaughtered at the Łódź abattoir were:— 1,167,640 pigs, 99,065 adult cattle, 575,427 calves, 19,802 horses and 132,423 sheep. The percentage incidence of infectious diseases was as follows. Tuberculosis: adult cattle 39·2, calves 0·168, pigs 1·79, horses 0·045, sheep 0·067; salmonellosis: adult cattle 0·008, calves 0·0107, pigs 0·005, horses 0·02, sheep 0·0015; pasteurellosis: adult cattle 0·01, calves 0·001, pigs 0·053, horses 0·005 (one case); foot and mouth disease: adult cattle 0·348, calves 0·007, pigs 0·68; swine erysipelas: adult cattle 0·001 (one case), pigs 0·19; swine fever 0·662. The highest number of disease entities was found in pigs, the lowest in sheep. A steady increase in the incidence of TB. in adult cattle was noted, 35·4% in 1952 and 46·1% in 1957. The inci-

dence of TB. and salmonellosis, the only two conditions encountered all the time and in all species, is discussed.—M. GITTER.

ROWLANDS, W. T. (1958). **Diseases of sheep.** —*Bull. Minist. Agric., Lond.* No. 170. pp. 38. H. M. Stat. Off. 4s. **815**

This book will prove invaluable to the working shepherd. It deals clearly with all the important diseases of sheep season by season and describes the measures necessary for their treatment, prevention and control as an essential part of the shepherd's seasonal and daily activities.

The book will be of interest to veterinarians in view of this unusual approach although individual diseases are dealt with too superficially for it to be of much value for reference.

Since the text frequently exhorts the shepherd to seek the advice of his local veterinary surgeon, "supported as he is by the Ministry of Agriculture's Veterinary Investigation Service with its laboratories situated at various centres", the appendix listing the addresses and telephone numbers of these centres seems unnecessary.

—H. SCOTT MCTAGGART.

MCHUGH, J. F. & EDWARDS, M. S. H. (1958). **Lamb loss investigations at Rutherglen Research Station.**—*J. Agric. Vict.* **56,** 425, 427, 429-431, 433-435 & 437-438. **816**

The causes of death of lambs between birth and weaning have been assessed during a seven-year study of a flock of predominantly Border Leicester × Merino ewes (aged from 2-9 years) mated mostly to Dorset Horn or Southdown rams. Seasons were good and 6,448 ewes, lambing between April and August in paddocks of about 40 acres, produced 7,307 lambs of which 722 died. Paddocks were inspected twice daily; dead lambs were examined P.M. and the condition and milk supply of the ewes were noted.

Of all lambs 5·8% were stillborn or died within 2 days; 1·2% died during the 3rd to 10th day; 1·0% between 10 days and marking (about 28 days) and 1·9% between marking and weaning.

Seventeen "causes" of death were implicated; between birth and 2 days the major causes were failure to breathe, insufficient milk, and desertion. Infection became important only beyond the second day of life. Losses due primarily to bad weather or predators were low. Ewes bearing their 7th or 8th lamb lost more than ewes bearing their 1st to 6th. During the first 10 days of life, losses amongst single lambs were about half those amongst multiple-birth lambs.

—G. ALEXANDER.

WATTS, P. S. & RAC, R. (1958). **Causes of mortality in chickens up to ten days old.** — *Brit. vet. J.* **114,** 396-407. [Authors' summary modified.] **817**

All deaths during the first 10 days of life in 20,746 chicks hatched and maintained under identical conditions were investigated. The greatest single factor was omphalitis (48·7%), followed by unabsorbed yolk sac (30·7%). Minor causes of death were pneumonia (6·9%) uricaemia (7·8%), and pullorum disease (4·6%). Incidence of pneumonia varied with farm of origin and month of hatching, decreasing as the season proceeded. That of omphalitis was greatest during the earlier part of the hatching season. Whether or not the total death rate rose or fell as the season proceeded, the proportion of deaths due to omphalitis fell 40% between the beginning and end of the season. Only in one case was there significant evidence that incidence of omphalitis was affected by the farm of origin of the eggs, but as all were produced under first class commercial conditions it was not possible to study the effect of faulty farm management.

NOSSLIN, B. F. & NYMAN, M. (1958). **Haptoglobin determination in diagnosis of haemolytic diseases.** — *Lancet* May 10th, 1000-1001. **818**

Haptoglobin is a group of mucoproteins belonging to the alpha-2 proteins of serum, characterized by a pronounced affinity for haemoglobin. The haptoglobin content is raised in diseases accompanied by inflammatory, neoplastic or degenerative changes.

In anaemia, a normal or raised content indicates absence of haemolysis and a reduced content is evidence (in the absence of liver disease) of haemolysis.—R.M.

IRVINE, C. H. G. (1958). **The blood picture in the race horse. I. The normal erythrocyte and hemoglobin status—a dynamic concept.** — *J. Amer. vet. med. Ass.* **133,** 97-101. [Author's summary modified.] **819**

Haemoglobin percentage, r.b.c. counts, packed cell volumes, and the indexes derived therefrom, are given for 264 racehorses. Reasons for low resting levels are discussed.

The dynamic concept of the erythrocyte level is advanced. Attention is drawn to the fallacy of using a blood sample taken without regard to this as an indication of the blood picture, since low levels may indicate a high state of physical fitness rather than anaemia, whereas a functional anaemia may be accompanied by normal levels. Conversely, high resting levels are often pathological. The author discussed the

significance and mechanism of the increase under certain conditions.

SEATON, V. A. (1958). **Pulmonary adenomatosis in Iowa cattle.**—*Amer. J. vet. Res.* **19,** 600-609. **820**

A description of the clinical and epidemiological features of the disease and its morbid anatomy. The relationship between pulmonary adenomatosis in cattle and similar diseases in sheep (jaagziekte and synonyms), horses and man is discussed. Attempts at transmission failed and S. thinks that pathogenesis "may revolve around the alterable chemical constituents of food plants and the appropriate bacterial flora necessary for their digestion."

—L. M. MARKSON.

CORNELIUS, C. E., THEILEN, G. S. & RHODE, E. A. (1958). **Quantitative assessment of bovine liver function, using the sulfobromophthalein sodium clearance technique.** —*Amer. J. vet. Res.* **19,** 560-566. **821**

The disappearance of intravenously administered sulphobromophthalein sodium from the plasma was found to be essentially logarithmic. Using serial samples of plasma, estimations were made of hepatic clearance of the dye, minimum values for hepatic plasma flow, and plasma volume. The technique was sensitive to acute and subacute hepatic disease, as well as to fibrotic changes in the bovine liver.

—L. M. MARKSON.

HART, K. E. & MACKINNON, M. M. (1958). **Enzootic paradontal disease of adult sheep in the Bulls-Santoft area.**—*N. Z. vet. J.* **6,** 118-123. [Authors' summary modified.] **822**

An apparently locally enzootic disease is characterized by a granulomatous periodontitis and progressive ill-thrift, and affects only mature sheep. A summary of the laboratory findings following investigations into the aetiology and pathogenesis and the results of some forms of treatment are given. Problems connected with the unknown aetiology, and the apparent local incidence, of the disease are discussed.

YOST, D. H. (1958). **Keratoconjunctivitis in the goat.**—*J. Amer. vet. med. Ass.* **133,** 427-430. [Author's summary modified.] **823**

Keratoconjunctivitis in the goat is a mild to severe necrotizing condition of the eye involving the conjunctiva, cornea, and occasionally the iris. The cause is unknown. Eyes not severely affected heal without permanent lesions but, where massive necrotizing lesions have occurred in the cornea, partial to total loss of vision results.

ENGLERT, H. K. (1958). Zwei Fälle von Erythrose beim Schwein. [**Erythrosis in two pigs.**]—*Mh. VetMed.* **13,** 102-103. **824**

Of 100 cases of leucosis in pigs observed by the author, 2 were diagnosed as erythrosis. These had been provisionally diagnosed as swine erysipelas and anthrax, although there was no fever. Liver and spleen were enlarged and bone marrow was dark red. The condition was regarded as erythraemic myelosis.

—E. S. FOUNTAIN.

GREGERSEN, K. (1958). Lobulaer aksedrejning af leveren hos malkende søer. [**Lobular torsion of the liver in lactating sows.**] —*Medlemsbl. danske Dyrlaegeforen.* **41,** 299-301. **825**

G. had seen four cases in three years in a population of about 2,000 sows; all four were aged, in about the third week of lactation, and had large litters. P.M. examination revealed torsion of the right or left outer lobe of the liver (180° in one, 360° in two); in one of the last two the affected lobe was twice the size of the rest of the liver, and in the other the liver capsule was ruptured, with severe haemorrhage. Other lesions included extensive peritonitis with varying quantities of thin, blood-tinged fluid. The course was acute, with death in 12–18 hours. Early symptoms were inappetence, unrest and unwillingness to suckle the young; later severe and prolonged vomiting, ceasing during the last few hours of life when there was fever, with cyanosis of extremities, severe dyspnoea and extreme unrest. The prognosis is very poor unless early surgical intervention is possible.—F.E.W.

HENNING, M. W. (1958). **The health of the baby pig.**—*J. S. Afr. vet. med. Ass.* **29,** 21-36. **826**

H. described a system of pig rearing, tried under South African conditions, based on taking the piglets from the sow at between 5 and 7 days of age and feeding them on diets containing powdered milk. It was important for the environmental temp. to be kept at 70°F. for the first few weeks.—R.M.

THOMPSON, S. W. & MURCHISON, T. E. (1958). **A histochemical study of five cases of leiomyometaplasts in dogs.**—*Cornell Vet.* **48,** 448-457. [Authors' summary modified.] **827**

Leiomyometaplasts were observed within intracytoplasmic vacuoles of hypertrophied smooth muscle cells of the intestine in five dogs. They were studied in paraffin-embedded tissue sections by various histochemical and physical

techniques. They did not contain haemoglobin or biological substances containing iron, nor deoxyribonucleic nor ribonucleic acid. Additional means for differentiating them from various intracellular parasites were also demonstrated. It is believed that they constitute a distinct morphological entity, exhibiting definitive histochemical and histophysical characteristics which are readily demonstrable. [See also *V.B.* **28,** 3364.]

Trauth, O. (1958). Studien zur Architektonik des arteriellen Gefässbaumes in der Hundeniere, mit besonderer Berücksichtigung der Umbauvorgänge bei chronischen Schrumpfnieren. **[Arterial network in dog kidney, particularly in chronic sclerosis.]**—*Inaug. Diss., Munich* pp. 32. **828**

The arterial network was demonstrated by X-ray contrast and in plastic-corrosion specimens, in normal dogs and dogs with "chronic contracted kidneys". The role of inflammation in the pathogenesis of the latter condition was discussed.—R.M.

Shively, J. N., Michaelson, S. M. & Howland, J. W. (1958). **The response of dogs to bilateral whole-body Co irradiation. I. Lethal dose determination.**—*Radiation Res.* **9,** 445-450. [Authors' summary modified.] **829**

40 young dogs were exposed to single bilateral doses of radiocobalt gamma rays. The mid-line tissue lethal dose was estimated to be 335 r. Statistically significant differences in length of survival after irradiation and weight loss at death were observed when low- and high-dose groups were compared.

Haley, T. J., Flesher, A. M. & Komesu, N. (1958). **Effect of a dithiol on survival time after irradiation.**—*Nature, Lond.* **181,** 1405-1406. **830**

Mice were exposed to 550 r acute whole-body X-irradiation and received 50 mg./kg. of D-L-6,8-dithioloctanoic acid, some before and some after irradiation. In all cases the survival time was increased but the mortality rate was unaffected. Mechanisms involved in this partial protection are obscure, but dithiols are known to form resonance-stabilized radicals which could interact with the various oxidizing radicals produced by the ionizing radiation.—E.V.L.

Kimpton, D. E. D. (1958). **The use of "thick section technique" for the investigation of pathological changes in tissue.**—*J. med. Lab. Tech.* **15,** 175-184. **831**

K. recommends Heidenhain's "Susa" as the best fixative for this technique [with 4% formol saline as an alternative], and itemizes a dehydration-clearing schedule based on alcohol and chloroform. A paraffin wax–ceresin mixture wih a congealing point of 49°C. was used for embedding and sections up to 500 μ were cut. The sections were stained unmounted (celestine blue and haematoxylin & eosin techniques are given in detail), dehydrated, mounted in neutral Canada balsam and examined under a binocular microscope magnifying from 15 to 25 times.

Variations are possible such as mounting sections on paper for transferring to card for display, or for subsequent mounting in gelatine on a Perspex base.—L. M. Markson.

See also abst. **911** (book, surgery).

POISONS AND POISONING

Oplištil, M., Bohosiewicz, M. & Janowski, W. (1958). Terenowa ekspertzya toksykologiczna w przypadku zatrucia bydła arsenem. **[Arsenic poisoning in cattle.]** — *Méd. vét., Varsovie* **14,** 290-291. **832**

An account of an outbreak associated with the use of arsenical preparations against lice. A drop in milk yield, loss of appetite and diarrhoea were noted in adult cows while 10 yearling heifers and 3 young calves were more severely affected and had ataxia. Some of the heifers (numbers not stated) were slaughtered and arsenic was found in the contents of their digestive tracts. The cows were not severely affected because they were tied up in the stalls, whereas the younger animals kept loose had licked each other.—M. Gitter.

Pearson, J. K. L., Todd, J. R. & Baird, S. (1958). **An outbreak of aldrin poisoning in suckling lambs.** — *Vet. Rec.* **70,** 783-785. [Authors' summary modified.] **833**

A case is reported in which 105 of 107 lambs died from aldrin poisoning as a result of misuse of an insecticide concentrate containing aldrin. The clinical symptoms at various stages after exposure are described and an account is given of P.M. and histological findings in seven of the lambs.

EKSTAM, M. (1958). Något om fortsatta undersökningar rörande fosterdöd hos gris. [**Further investigations concerning foetal death in pigs.**]—*Medlemsbl. sverig. VetFörb.* **10,** 54-58. **834**

Earlier investigations [*V.B.* **27,** 1884] had suggested that increased incidence of foetal death in pigs might be due to dicoumarol poisoning. Confirmation by chemical means being impossible, even in experimentally poisoned pigs, a different approach was made. The blood coagulation time (c.t.) in sows and gilts was studied; cases with a prolonged c.t. were treated with vitamin K and the tests repeated. Vitamin K therapy yielded good results especially when continued weekly to within a few days of farrowing.

Prolonged c.t. was found not only in pregnant animals that died suddenly, but in pigs that aborted and in which extensive internal haemorrhages were found in various organs and tissues as well as in the foetal membranes, serological and bacteriological findings being negative. Pigs with haemorrhage from the large intestine and a staggering gait, as well as animals that aborted and had prolonged c.t. were successfully treated with vitamin K; on the same farms sporadic cases continued to occur where feeding stuffs from the same source were continually fed even after deaths had occurred. In all cases, rat control with dicoumarol had been carried out, either on the farm or at the factory that supplied the feeding stuffs. The incidence of mortality associated with internal haemorrhages showed a similar curve in 1956 and 1957. Rat control, as well as growth of moulds in feeding stuffs, is largely governed by climatic conditions, as is the feeding of fresh herbage containing cumarin (*e.g.* species of *Melilotus* such as sweet clover).—F.E.W.

COX, D. H. & HARRIS, D. M (1958). **A diagnostic test for organic phosphate insecticidal poisoning of swine.**—*J. Amer. vet. med. Ass.* **133,** 329-330. [Authors' summary modified.] **835**

The colour test for blood cholinesterase, previously described for use in the diagnosis of organic phosphate insecticidal poisoning of cattle [*V.B.* **28,** 3385], was modified for use in pigs by extending the incubation time to 45 min.

PETTY, C. S. (1958). **Histochemical proof of organic phosphate poisoning.** — *Arch. Path.* **66,** 458-463. [Author's summary modified.] **836**

Histochemical demonstration of diminished cholinesterase activity in the motor end-plate region in intercostal muscle was the method used to prove the cause of death in a case of fatal human poisoning with "Systox" (a toxic organic phosphate). This was correlated with the post-mortem red blood cell cholinesterase level. *In vitro* studies with human muscle and both *in vitro* and *in vivo* studies of rat muscle demonstrate that "Systox" is capable of depressing the cholinesterase at motor end-plates.

HUTTON, E. M., WINDRUM, G. M. & KRATZING, C. C. (1958). **Studies on the toxicity of *Indigofera endecaphylla*. II. Toxicity for mice.**—*J. Nutr.* **65,** 429-440. [Authors' summary modified.] **837**

Severe liver damage can be produced in mice by feeding the seed of *I. endecaphylla;* the toxicity is not reduced by heating it strongly. Similar damage can be produced by feeding the chloroform-extracted residue of the leaf which is free from β-nitropropionic acid. The degree and type of histological liver damage is a reliable index of the toxicity of the material.

GIBBONS, W. J. (1958). **Green oats intoxication and icterogenic photosensitization in cattle.**—*Vet. Med.* **53,** 297-300. **838**

Examination of a severe outbreak of green oats intoxication showed that oat tetany should be prevented by supplying a good mineral mixture to cattle during autumn grazing, before oat grazing, by providing adequate calcium and magnesium in the soil, and by making available a free choice of minerals in oat pastures.

Icterogenic photosensitization may best be controlled by mowing or burning suspected pastures to remove deteriorating forage, applying 100-200 lb. of sodium or ammonium nitrate per acre, avoiding overgrazing and allowing new grass to reach a height of 6-8 inches to discourage the consumption of dead mouldy grass. —D. S. PAPWORTH.

WHITE, E. P. (1958). **Photosensitivity diseases in New Zealand. XII. Concentration of the facial eczema poison.**—*N. Z. J. agric. Res.* **1,** 433-446. [Author's summary modified.] **839**

This paper describes procedures for the preparation of concentrates of the facial eczema hepatotoxin from toxic dried grass. Fractions have been made repeatedly containing 1/3,000 of the weight of the original dried grass with very little loss of poison, and fractions containing 1/20,000 and up to 1/100,000 of the weight with a slight loss of the poison. The concentration of the poison in relatively toxic dried grass is well below 1 part in 100,000.

See also abst. **760** (toxicity of meal mites for animals)

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

FRISCH, E. & GARDNER, L. I. (1958). **Failure of suramin (Bayer 205; Germanin) to cause changes in the adrenal cortex of the rat.** — *Endocrinology* **63,** 500-501. [Authors' abst. modified.] **840**

An attempt was made to reproduce the experiments of Humphreys & Donaldson (1942) in which histological lesions in the adrenal cortices of rats had been produced by repeated injections of suramin. Despite considerable mortality among the injected rats in the present experiment, no adrenal lesions were demonstrable.

CANY, J. & LEPEINTRE, M. (1958). Action antihistaminique du cuivre. Etude pharmacodynamique des complexes cuivre–histamine. **[Antihistamine action of copper.]**—*C. R. Soc. Biol., Paris* **151,** 1729-1735. **841**

"In vitro" studies using the isolated ileum preparation are reported to show the effects of several copper complexes on histamine under various conditions.—D. S. PAPWORTH.

ALTSCHUL, R. & HOFFER, A. (1958). **Effects of salts of nicotinic acid on serum cholesterol.**—*Brit. med. J.* September 20th, 713-714. [Authors' summary.] **842**

It seems well established that nicotinic acid in relatively high doses decreases serum cholesterol in healthy and sick human beings. The toxicity of the substance is discussed, and it is pointed out that the high acidity rather than a specific action may be responsible for the occasional disturbances, such as gastro-intestinal reactions.

Tests on 12 healthy young individuals showed that a buffered solution of nicotinic acid is as efficacious in decreasing serum cholesterol as is the pure nicotinic acid.

In cases of poor tolerance of nicotinic acid a solution of nicotinic acid buffered with $NaHCO_3$ (or $NaHCO_3$ and $KHCO_3$) deserves to be tried.

NICOL, T., BILBEY, D. L. J. & WARE, C. C. (1958). **Effect of various stilbene compounds on the phagocytic activity of the reticulo-endothelial system.**—*Nature, Lond.* **181,** 1538-1539. **843**

In both males and females oestrogens have a strong stimulating influence on the reticulo-endothelial system. Experiments on mice indicated that diethyl stilboestrol (dihydroxy-diethyl stilbene) produced the highest average phagocytic index; other stilbene compounds had little or no effect on phagocytosis. The strongest stimulants all possessed high oestrogenicity.

—E.V.L.

CURRY, D. M. & BEATON, G. H. (1958). **Cortisone resistance in pregnant rats.**—*Endocrinology* **63,** 155-161. [Authors' summary modified.] **844**

It was demonstrated, using doses of 5 to 20 mg. per day, that pregnant rats exhibit a marked resistance to the effects of cortisone. This resistance was evident with regard to changes in alanine-glutamic transaminase activity, blood amino nitrogen and sugar levels and nitrogen balance data. There was no apparent resistance to the increase in liver weight produced by the hormone. Removal of the foetus alone did not affect resistance whereas removal of both the foetus and placenta abolished it.

DIRKSEN, G. (1958). Lokalanaesthetika mit schnellem Wirkungseintritt in der Anwendung beim Rind. **[Rapidly-acting local anaesthetics and their use in cattle.]** — *Dtsch. tierärztl. Wschr.* **65,** 313-317. [Summary in English.] **845**

D. compared the action of 3 drugs for infiltration, surface and nerve block anaesthesia: (1) lignocaine hydrochloride, (2) "Hostacain" [described by Ther (1953), *Arch. exp. Path. Pharm.* **220,** 306], (3) "Tutocain-Neu" [2-(beta-dimethylaminoethoxy) - 3 - methylbenzoic acid methyl ester]. They all induced anaesthesia more rapidly than old "Tutocain" (butamin hydrochloride). The action of "Tutocain-Neu" persisted longer than the other two. The recommended concentrations of these drugs were 0·25–2% for epidural block, 1–2% for peripheral nerve block, and 0·5–1% for infiltration anaesthesia.—R.M.

TREUSCHER, R. & MIETH, K. (1958). Hostacain, ein neues Lokalanästhetikum in der Veterinärmedizin. **["Hostacain", a new local anaesthetic.]**—*Mh. VetMed.* **13,** 353-355. **846**

"Hostacain" is described as a salt of butyl-aminoacetic acid-2-methyl-6-chloranilid. It was found satisfactory for infiltration anaesthesia in horses, cattle and pigs, nerve block in horses, and epidural anaesthesia in cattle. The special advantage of the drug was its rapid action.

—R.M.

HANSSON, C.-H. & JOHANNISSON, D. (1958). **Inhalation anaesthesia with automatic artificial respiration during succinylcholine relaxation in large animals.**—*Nord. VetMed.* **10,** [Nos. 7-8] 469-486. [In English. Summaries in Swedish and German. Authors' summary modified.] **847**

A circle-circuit anaesthesia apparatus with an automatic respirator for horses and cows has been constructed. About 70% nitrous oxide gave sufficient anaesthesia in both horses and cows. After premedication with atropine and induction with a short-acting barbiturate, nitrous oxide was used as anaesthetic agent and succinylcholine as muscle relaxant (BNS-anaesthesia), respiration being maintained artificially with the above mentioned apparatus.

BNS-anaesthesia was unsuitable for horses. In cows the method has given promising results and seems to be suitable particularly for operations of long duration when complete muscle relaxation is wanted.

MAYKUT, M. O. (1958). **Studies on degeneration of myelin sheaths of nerves caused by long-acting local anaesthetics injected subcutaneously into guinea pigs.**—*Canad. J. Biochem. Physiol.* **36,** 511-516. **848**

Nineteen long-acting local anaesthetics were used to study the neurological changes induced on cutaneous nerves after s/c inoculation into the backs of g.pigs. Some caused a generalized inflammatory reaction with little specific injury to the nerves, while others induced a greater degree of nerve injury with little inflammatory reaction. The longer-acting local anaesthetics caused both generalized tissue damage and specific injury to the nerves. The severity of the damage appeared to be determined largely by components other than the local anaesthetic in the commercial preparations.

The results indicated two kinds of nerve injury (a) oedema and (b) actual destruction with Wallerian degeneration, with or without oedema. Duration of anaesthesia depended on the rate of regeneration of the damaged nerve tissue and appeared to be associated with the Wallerian degeneration. It was apparent that oedema does not give rise to prolonged anaesthesia but it is possible that the anaesthesia obtained may be of sufficient duration for practical purposes.

Procaine amide, procaine–nembutal combination, procaine base, and cyclaine caused general tissue and specific nerve damage and tended to approach the ideal long-acting local anaesthetic.—R. V. L. WALKER.

See also abstr. **621** (sensitivity to antibiotics of glanders bacilli; **655** (tetanus); **660-661** (heat sterilization); **663-664** (amphotericin B); **667** (pimaricin); **668** (a yeast antibiotic); **676** (berenil); **678** (suramin, antimosan and their combinations); **680** (pyrimidylaminophenylarsonic acid compounds); **683** (synergism of some antimalarial drugs with sulphonamides); **684** (nicarbazin); **687** (pyraldin); **751-752, 754, 756-757, 833 & 835** (parasiticides); **763, 770, 781 & 783** (anthelmintics); **790** (N-desacetylthiocolchicine in canine leucosis); **794** (bloat).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

MACDONALD, M. A. & BELL, J. M. (1958). **Effects of low fluctuating temperatures on farm animals. I. Influence of ambient air temperature on the respiration rate, heart rate, and rectal temperature of lactating Holstein-Friesian cows. II. Influence of ambient air temperature on water intake of lactating Holstein-Friesian cows.**—*Canad. J. Anim. Sci.* **38,** 10-22 & 23-32. **849**

I. Lactating cattle were kept in an uninsulated shed where the daily minimum air temperature ranged from −5° to 38°F. A decrease in air temp. resulted in an increase of rectal temp. and heart rate with a decrease in respiration rate. Any change in rectal temp. was positively correlated with respiration rate. The influence of low temp. appeared to result in small changes in the physiological characteristics but there was some evidence of stress in acclimatization at extreme low temperatures.

II. Under the same housing conditions the effect of low fluctuating temperatures on water intake and the ratio of water intake to various other factors are reported. Thermal stress effects in response to low temp. in the lactating cattle appeared to be dissipated within 24 hours or were not evident in any environmental changes from day to day. It could not be concluded that cows are entirely free from thermal stress at temperatures as low as 0°F.

—R. V. L. WALKER.

WRENN, T. R., BITMAN, J. & SYKES, J. F. (1958). **Body temperature variations in dairy cattle during the estrous cycle and pregnancy.** —*J. Dairy Sci.* **41,** 1071-1076. **850**

Vaginal temperature was recorded daily in 24 cows during 54 oestrous cycles, and in 9 cows in the terminal stage of pregnancy. Temperature fluctuated with the oestrous cycle, being lowest just before oestrus, high on the day of oestrus, with a fall at the time of presumed ovulation and a more gradual increase during the luteal phase. From the 10th to the 3rd day before

parturition the temp. was slightly higher, declining sharply when calving was imminent. In preliminary tests with spayed cows the temp. rose after dosage with progesterone, and it is suggested that endogenous elaboration of progesterone may have a role in normal cyclic temperature variations which may be related to activity of the corpus luteum.—F.E.W.

Dawes, G. S., Mott, J. C. & Shelley, H. (1958). **The ability of the foetal and new-born animal to withstand total anoxia.**—*J. Physiol.* **144,** No. 1. pp. 18P-19P of Proceedings. [Abst. from authors' abst.] **851**

Foetal lambs of 83–91 days gestational age, asphyxiated by tying the umbilical cord and preventing inhalation of air, recovered when the cord was untied after 40 min. anoxia; the blood pressure and heart rate, which had fallen during anoxia, returned to their initial levels and there was no evidence of permanent damage to the respiratory centre or other motor centres. Lambs of 120–146 days gestation age could only withstand 15–20 min. anoxia without circulatory failure, and adult sheep could not be resuscitated after re-breathing nitrogen from a bag for only 7 min. Maintenance of an adequate circulation is of the first importance and this is related to the carbohydrate concentration in the heart at the onset of anoxia.

Cross, K. W., Dawes, G. S. & Mott, J. C. (1958). **A change in regional oxygen consumption during anoxia in the new-born lamb.**—*J. Physiol.* **143,** No. 2. p. 71P of Proceedings. [Abst. from authors' abst.] **852**

When the arterial oxygen saturation was reduced to 31–43% by lowering the oxygen content of the inspired air, the oxygen consumption of the hind quarters was reduced relative to that of the whole lamb. Thus in one instance when the arterial O_2 saturation fell to 41%, the oxygen consumption of the whole lamb was not significantly altered, but that of the hind limbs fell by as much as 25%, although inferior vena caval flow was increased.

Macfarlane, W. V., Robinson, K., Howard, B. & Kinne, R. (1958). **Heat, salt and hormones in panting and sweating animals.** — *Nature, Lond.* **182,** 672-673. **853**

The effects of exposing 7 normal men to 41°C. for 4 hours were compared with a similar exposure of 3 Romney and 10 Merino sheep. Exposing the men to high temperatures in summer reduced the urine flow and sodium excretion and in parallel increased the rate of water and sodium loss through sweating. Aldosterone-like activity increased in the urine. The sheep had a similar fall in urine excretion but sodium excretion and respiratory rate increased. Winter exposure to heat of men and sheep produced a similar reduced urine flow but no measurable amount of antidiuretic substance in the plasma.

The sheep, after exposure to heat in winter, were injected with 15–20 mg. deoxycortone (DCA) and again heated. Sodium excretion in the urine fell and antidiuretic substance appeared in the blood. Winter heating resulted, in both men and sheep, in a much smaller decrease of plasma and extracellular fluid volume compared with summer heating or DCA treatment. Hence (a) the availability of tissue water would appear to differ in summer and winter, (b) the change in urinary sodium is associated with the method of evaporative cooling, (c) which is not solely explained by the presence of sodium-retaining hormones.

—Joyce E. Hammant.

Barker, J. N. & Britton, H. G. (1958). **Lactate and pyruvate metabolism in the foetal sheep.**—*J. Physiol.* **143,** No. 2. pp. 50P-51P of Proceedings. [Abst. from authors' abst.] **854**

During hypoxia the maternal blood pyruvate rose but the foetal pyruvate showed no consistent trend.

In a number of experiments, tissues were removed, frozen in liquid nitrogen, and their lactic acid content determined. The results indicated that, very approximately, the concentration of lactic acid in the tissues was equal to that in plasma. If this holds during severe hypoxia, then glycolysis could account for a considerable part of the energy deficit in this condition.

Hutton, J. B. (1958). **Oestrogen function in established lactation in the cow.** — *J. Endocrin.* **17,** 121-133. [Author's summary modified.] **855**

In six experiments the effect on milk yield of injecting oestradiol monobenzoate at five dose levels was studied on 76 cows. The doses ranged from 6·25 to 100 mg., and all increased the percentage of non-fatty solids. These changes were due mainly to increases in the protein, lactose and ash fractions and persisted for several weeks. When more than 25 mg. was injected, fat percentages also increased and milk yields declined. At the 12·5 mg. level, the yields of fat and non-fatty solids both increased. These results indicated that galactopoietic responses could be obtained only within a restricted dose-range, the limits of which were affected by stage of pregnancy and differences in breed.

The similarity between these results and the changes occurring in the milk of pregnant cows during a normal lactation suggests that the latter are probably determined by a progressive rise in blood oestrogen levels as pregnancy advances. The results are discussed in relation to the effect of pasture oestrogens on milk composition and the possibility of improving the quality of milk by oestrogen administration.

BARRY, J. M. (1958). **The source of proline for casein biosynthesis.** — *Biochem. J.* **70,** 177-179. [Author's summary modified.] **856**

From an experiment with [^{14}C]proline it is concluded that the mammary gland of the goat takes free proline from the blood to provide at least half of the proline residues of casein. It is calculated that at least half the residues of non-essential amino-acids in casein are not synthesized in the mammary gland, but come directly from the blood.

KENNEDY, G. C., PEARCE, W. M. & PARROTT, D. M. V. (1958). **Liver growth in the lactating rat.** — *J. Endocrin.* **17,** 158-160. [Authors' summary modified.] **857**

During the 2nd and 3rd weeks of lactation the liver of the rat hypertrophied to about twice its normal size. There was a smaller, but significant, increase in the deoxyribonucleic acid content, indicating an increase in cell number. The increase in liver protein was reversible, but that in the nucleic acid was not. These effects appeared to be due to changes in the intake of food.

OSTERHOFF, D. R. (1958). Bepaling van bloedgroepe by huisdiere. **[Blood groups in domestic animals.]**—*J. S. Afr. vet. med. Ass.* **29,** 77-94. [In Afrikaans. Summary in English.] **858**

A discussion of the literature on blood groups in horse, cattle, pig, sheep, dog, fowl. A laboratory for the study of blood groups in animals has been set up at Onderstepoort.

—R.M.

MURAYAMA, M. (1958). **Titratable sulfhydryl groups of horse, sheep, dog, and cow hemoglobins at 0° and 38°.**—*J. biol. Chem.* **233,** 594-596. [Author's summary modified.] **859**

Differences in the conformation of sulphydryl groups in haemoglobins of horses, sheep, dogs, and cows were studied. The maximal number of titratable —SH groups in horse and cow haemoglobins is the same (six sulphydryl groups per molecule). However, cow haemoglobin has a negative temperature coefficient of binding of heavy metals. Sheep and dog haemoglobins have eight and ten titratable —SH groups per molecule, respectively.

WARNER, E. D. (1958). **The organogenesis and early histogenesis of the bovine stomach.**— *Amer. J. Anat.* **102,** 33-63. [Author's summary modified.] **860**

The studies were made in embryos ranging in crown–rump length from 9·5 to 77 mm. In the youngest specimens a spindle-shaped gastric enlargement was present. From this primordium all of the stomach compartments arose. Later morphogenesis was followed until the adult configuration was attained. There was no indication of an oesophageal contribution to any part of the compound stomach. Histogenetic studies showed that the undifferentiated epithelia of the oesophagus and the stomach were nearly identical in early stages. Epithelial stratification began in the oesophagus and progressed in sequence to the oesophageal groove, to areas of the rumen, reticulum and omasum adjacent to the groove and finally to the more remote parts of these chambers. Changes in the abomasal epithelium toward the simple columnar condition began relatively late and appeared to be unrelated to those occurring in the other compartments. A brief comparative review of mammalian stomach morphology and histology emphasized the dearth of evidence to support the idea of an oesophageal origin for any stomach component.

KAY, R. N. B. (1958). **The development of parotid secretion in young goats.**—*J. Physiol.* **143,** No. 2. pp. 63P-64P of Proceedings. [Abst. from author's abst.] **861**

The parotid glands supply a large part of the water and alkali required to preserve the fluid nature and pH of the digesta in the rumen. In calves the parotid gland secretes little saliva in the first month of life, when the rumen is small and relatively empty. The development of parotid function was also studied in goats, 2 to 276 days of age.

HILL, K. J. (1958). **Nervous structures in the reticulo-rumen epithelium of the lamb.** — *J. Physiol.* **143,** No. 2. pp. 30P-31P of Proceedings. [Abst. from author's abst.] **862**

Previous findings [*V.B.* **28,** 1606] of nervous structures in the reticulo-rumen epithelium of the kid have been confirmed and extended in material from young lambs.

BELL, F. R. (1958). **The electroencephalogram of conscious goats and its association with the**

ruminant state.—*J. Physiol.* **143,** No. 2. pp. 46P-47P of Proceedings. [Abst. from author's abst.] **863**

There appears to be a common factor linking the somnolent state and active rumination in goats. Since short-chain fatty acids are the end products of cellulose digestion in ruminants it is possible that the blood level of these substances provides the stimulus for the onset and cessation of rumination.

Polin, D. & Sturkie, P. D. (1958). **Parathyroid and gonad relationship in regulating blood calcium fractions in chickens.** — *Endocrinology* **63,** 177-182. [Authors' summary modified.] **864**

Plasma diffusible calcium levels of cocks and capons with or without oestrogen treatment are significantly decreased by parathyroidectomy. The level of non-diffusible calcium is increased by oestrogen in sham operated and starved controls, but not when oestrogen-treated birds are parathyroidectomized and diffusible levels are significantly decreased. Spontaneous recovery from parathyroidectomy occurs in about 6 days. Cocks and capons injected with oestrogen after parathyroidectomy show no increase in non-diffusible levels when diffusible levels are still abnormally low by 4 days after the operation. It is suggested that parathyroids and oestrogen are indirectly related in regulating plasma calcium of birds. The parathyroids maintain diffusible calcium at normal levels so that oestrogen can increase non-diffusible calcium.

Arnesen, K. (1958). **The secretory apparatus in the thymus of mice.**—*Acta path. microbiol. scand.* **63,** 339-349. [In English. Author's summary modified.] **865**

The occurrence of cysts, alveoli, and tubules in the thymus of pure strain and hybrid mice is described. The structures are lined with epithelial cells of three types: ciliated, mucous, and pseudo-stratified. In one case mitochondria have been demonstrated in the epithelial cells. The cysts etc. often contain periodic acid-Schiff positive, colloid material, which is even found intracellularly in the cells of the mucous type.

The structures are interpreted as secretory units.

Comsa, J. (1958). **Influence of the thymus upon the reaction of the rat to anterior pituitary growth hormone.** — *Nature, Lond.* **182,** 728. **866**

Inbred males weighing 130—160 g. were used. Growth was recorded daily. On the 16th day after hypophysectomy, daily injections were given as follows for 15 days: (a) 20 hypophysectomized rats received 0·5, 1, 2, 3 or 4 units growth hormone (4 rats per dose); of 60 thymectomized and hypophysectomized rats, (b) 20 were injected as above; (c) 20 received thymus preparation, 5, 10, 20, 35 or 50 units (4 rats per dose); (d) 20 received thymus preparation as above together with 2 units growth hormone. During the 15 day control period before hormone treatment began all the rats lost weight at a constant rate. Subsequently rats in group (a) gained weight at a greater rate than those of group (b); animals of group (c) ceased to lose weight, but those of group (d) exhibited a significant increase in growth rate.

—Joyce E. Hammant.

Koropov, V. M. [Edited by.] (1957). **[Collected works on physiology, dedicated to Nikolai Fedorovich Popov on the occasion of his 70th birthday.]**—*Trud. Mosk. vet. Akad.* **20,** pp. 255. [In Russian.] **867**

Professor N. F. Popov is head of the department for the physiology of farm animals at Moscow Veterinary Academy. This volume of collected works contains a biography of Popov by N. V. Kurilov and 42 scientific papers divided into 4 groups: physiology of the nervous system; physiology of digestion; physiology of the circulation; and general questions.

There are three papers on higher nervous activity in horses and one on experimental neurosis in horses. N. F. Soldatenkov deals with higher nervous activity in cattle; N. I. Lozhkin and A. A. Kudryavtsev and others deal with conditioned reflexes in cattle; also, the relation of " sleep " to milk yield in cows (V. A. Syusyukin).

In the section on digestion, A. P. Krotkova and N. I. Mitin describe some aspects of rumen physiology, particularly changes in pH and volatile acids during rumination. There are several papers on physiology of the stomach in horses and dogs.

The section on the circulation includes papers on the blood picture of pigs in relation to breed and feeding (I. I. Labutin & L. S. Vlasevich); measurement of blood pressure in farm animals by using an "oscillotonometer" (N. V. Ivanov); role of the sinocarotid zone in horses (I .I. Labutin).

Under the heading ' general questions ' are included studies on phosphorus metabolism in cows and calves, using radiophosphorus (A. I. Vertunov) and the action of higher fatty acids on proteolytic enzymes (V. N. Tikhomirova).

—R.M.

TAYEB, M. A. F. (1957). **The cranial nerves of the camel.**—*Vet. med. J., Giza* **4**, No. 4 pp. 171-182. [Author's summary modified.] **868**

The cranial nerves of the camel were examined in ten injected heads and necks.

The brain of the camel resembles that of the horse in shape but it is smaller. The pineal body is about three times that of the horse.

The buccinator nerve is voluminous and is aided by an additional branch from the inferior alveolar for the supply of the huge mass of buccal glands in this animal.

The temporal and the masseteric branches are detached by one trunk from the mandibular branch of the fifth. This branch passes through a special foramen which is absent in both ox and horse.

The anterior and posterior laryngeal nerves as well as the tracheal and oesophageal branches are supplied by one single trunk detached from the vagus caudal to the cranial sympathetic ganglion.

The course of the inferior laryngeal is short and direct.

The spinal accessory nerve differs in its formation and exit from that of other domesticated animals.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

KOCOT, M., ZAWADZKI, Z. & HEJŁASZ, Z. (1958). Wpływ przyżyciowego podawania streptomycyny na przedłużenie trwałości mięsa. **[Influence of streptomycin administration before slaughter on keeping quality of meat.]**—*Méd. vét., Varsovie* **14**, 275-280. [In Polish. Summaries in English and Russian.] **869**

I/v injections of rabbits and calves, with 10,000 units streptomycin per kg. body wt., one hour before slaughter, extended the keeping time of the meat by 48 hours. When in addition 25,000 units per kg. of penicillin were injected i/v 20 min. before slaughter the keeping quality was extended by 4 days. When both antibiotics were used they could be detected in meat for 8 days; when only one—penicillin could not be detected after 3 days and streptomycin after 2 days.—M. GITTER.

PIETERSE, P. J. S., PRETORIUS, P. J., VERBEEK, W. A. & HAMERSMA, P. J. (1958). Residuele estrogeenaktiwiteit in die weefsels van beeste na byvoeding van di-etielstilboëstrol en'n kombinasie van di-etielstilboëstrol en chloortetrasiklien. **[Residual oestrogenic activity in tissues following feeding of diethystilboestrol and a combination of diethystilboestrol and chlortetracycline to cattle.]** — *S. Afr. J. agric. Sci.* **1**, 217-226. [In Afrikaans. Summaries in English and French. English summary modified.] **870**

Residual oestrogenic activity was determined by biological assay in muscle and liver of cattle receiving 5 and 10 mg. stilboestrol per day as well as the meat of cattle receiving 10 mg. stilboestrol with 75 mg. chlortetracycline per day.

Residual activity was found only in one sample from cattle which received 10 mg. stilboestrol and 75 mg. chlortetracycline per day. This meat contained oestrogenic activity equivalent to 0·00235 μg. stilboestrol per g. of dried tissue. The low activity in meat of stilboestrol-treated animals is discussed.

BENTLEY, E. W. (1958). **Biological methods for the evaluation of rodenticides.**—*Tech. Bull. Minist. Agric., Lond.* No 8. pp. 35. (London: H.M. Stat. Off. 3s.) **871**

The Ministry of Agriculture has issued this new Technical Bulletin as a guide to the best methods of assessing new rodenticides. Both acute and slower-acting poisons are dealt with, and there is a short section on rodenticidal dusts. The bulletin is primarily addressed to manufacturers, but it should be of interest to health inspectors, medical officers of health and public analysts.—R.M.

See also abstr. **608** (faecal streptococci in meat); **613** (TB.); **625** (listeriosis); **746** (Q fever in Britain); **908** (report, Union of South Africa).

REPRODUCTION AND REPRODUCTIVE DISORDERS

ANON. NETHERLANDS. (1957). Jaarverslag K.I. 1957. Inhoudende het 12e jaarverslag van de centrale commissie van toezicht op de uitvoering van de K.I. in Nederland en het 7e jaarverslag van de federatie van provinciale bonden van vereningingen voor K.I. bij rundvee in Nederland. **[Annual report on artificial insemination for 1957.]** pp. 100. Utrecht: Centrale Commissie de K.I. [In Dutch. Summaries in English, French and German.] **872**

In the Netherlands during 1957, 991,032

cows were artificially inseminated, representing nearly half the cattle population over one year old. 61·2% became pregnant after first insemination. 1,032 bulls of 3 breeds were used and an average of 957 cows were inseminated from each bull during the year. Over 5,000 cows were inseminated with deep-frozen semen.

Results of two trials of A.I. in pigs in North Brabant province were given: 273 of 548 inseminated sows became pregnant after one insemination. The average litter size was 10·2 for sows and 7·5 for gilts. In Overijssel, 35 of 51 sows became pregnant after first insemination when a teaser boar was used to detect oestrus.—R.M.

GREGERSEN, K. (1958). Inseminering af søer. [**Insemination of sows.**]—*Medlemsbl. danske Dyrlaegeforen.* **41,** 302-304. **873**

G. reported results obtained in the first 10 months in a small insemination service for sows and gilts started in November 1956. The two donor boars were also used for natural service. The diluent used was "export cream No. 3" (as used by Rasbech) with 0.04% streptomycin; this was cheaper and simpler to use than glycine–egg yolk, and gave satisfactory results. Dilution varied from 3:1 to 1:3 and dosage of diluted semen between 100–180 ml. for both sows and gilts, the semen being used 1–6 hours after ejaculation. Mean pregnancy percentage for 30 sows and gilts to natural service was not much higher than that of 80 sows and gilts to insemination: 1·32 services and 1·56 inseminations for conception. Mean litter size with insemination was 11·65 for sows and 8·37 for gilts as compared with 8·42 and 6 respectively with natural mating. The reason for this could not be explained.—F.E.W.

VANDEMARK, N. L., SALISBURY, G. W., MOELLER, A. N. & BERKLEY, C. (1958). **Exploration of electronic methods for evaluating sperm motility.** — *Science* **127,** 286-287. **874**

Two principal assemblies of equipment have been utilized. The first incorporated a television camera chain in which an image pick-up tube and a single-line selector were used to observe the oscillographic display resulting from single cells in the field. The second assembly consisted of a single, stationary multiplier phototube viewing a restricted portion of the microscope field with the spermatozoa rendered bright in a dark field, again giving an oscillographic record. The methods show promise though they have so far not given results which approach the ideal for evaluating motility.
—E.V.L.

WHITE, I. G. & LINCOLN, G. J. (1958). **Riboflavin in yellow semen.**—*Nature, Lond.* **182,** 667-668. **875**

Yellow coloration of Friesian bulls' semen has been observed in a number of instances in Australia and New Zealand. Qualitative tests have shown that this is due to riboflavin being present in amounts 40 times greater than in colourless semen. Increased quantities of other flavins are also present. Blood riboflavin levels are normal. The coloration is uninfluenced by diet and appears to be a dominant hereditary characteristic. It does not affect fertility.
—A. ACKROYD.

CRAGLE, R. G., SALISBURY, G. W. & VANDEMARK, N. L. (1958). **Sodium, potassium, calcium, and chloride distribution in bovine semen.**—*J. Dairy Sci.* **41,** 1267-1272. [Summary modified.] **876**

Potassium is more concentrated within the spermatozoa of bovine semen than in the plasma. Sodium and calcium are more concentrated in the plasma than within the spermatozoa. Concentrations of sodium and potassium in the plasma are characteristic of individual bulls and of the ejaculate, when consecutive ejaculates are considered. As an average, sodium and chloride increase and potassium and calcium decrease in consecutive ejaculates.

DE MUELENAERE, H. J. H. & QUICKE, G. V. (1958). **Studies on the biochemistry of cock semen. 2. The problem of bacterial contamination.**—*S. Afr. J. agric. Sci.* **1,** 139-149. [In English. Summaries in Afrikaans and French. English summary modified.] **877**

Bacterial counts on cock semen revealed a much greater degree of contamination than in bull semen.

Hyamine 1622 (a quaternary ammonium compound) was an effective antibacterial agent but adversely affected the motility of the spermatozoa.

Glucose continued to disappear from a semen suspension long after the spermatozoa had lost all motility. Penicillin and, to a lesser extent, sulphanilamide and sulphapyridine were also effective antibacterial agents in semen suspensions.

LINDAHL, P. E. (1958). **Separation of bull spermatozoa carrying X- and Y-chromosomes by counter-streaming centrifugation.** — *Nature, Lond.* **181,** 784. **878**

Further to the 1956 work [*V.B.* **27,** 943], L. carried out 7 experiments at the same speed, 1,100 r.p.m., and 8 at 1,000 r.p.m., using semen from 10 bulls. 142 inseminations with "separated" semen gave 63 calves (a rather lower fertility rate than the controls). The sex ratio was not significantly different from normal. However if the "spinnings" are regarded separately, those with over and under 50% fertility are thought to be significantly different. In the high fertility group, 28 calves were female and 9 male; in the low group, 8 were female and 18 male; a significant difference.

L. concludes that the female-producing spermatozoa are the more susceptible to damage from the stress of higher-speed centrifugation, thus accounting for the 1956 result (all male calves). Further support is received from the finding that 1,000 r.p.m. gave significantly higher fertility than 1,100. [A more detailed account of this work has been published in *Acta agric. scand.* **8,** 226-230.]

—F. L. M. Dawson.

Austin, C. R. & Bishop, M. W. H. (1958). **Capacitation of mammalian spermatozoa.** — *Nature, Lond.* **181,** 851. **879**

Capacitation is the process which takes place in spermatozoa in the female genital tract prior to fertilization of the egg. Loss of the acrosome before penetration of the egg was observed in spermatozoa of hamster and g.pig. [See also *V.B.* **28,** 4136.]—R.M.

Krohn, P. L. (1958). **Litters from *C3H* and *CBA* ovaries orthotopically transplanted into tolerant *A* strain mice.**—*Nature, Lond.* **181,** 1671-1672. **880**

Female mice were rendered tolerant to tissues from a different strain of mice by i/p inj. of 0·15 ml. of a spleen suspension from the other strain. Tolerance was tested by skin grafting. The ovaries were then replaced by ovaries from the other strain. Strain A females mated a week after operation with strain A mice yielded cross-bred mice; when mated with C3H males, pure-bred C3H offspring were obtained.—R.M.

Sherman, J. K. & Lin, T. P. (1958). **Survival of unfertilized mouse eggs during freezing and thawing.** — *Proc. Soc. exp. Biol., N.Y.* **98,** 902-905. [Authors' summary modified.] **881**

This investigation has established the possibility of survival of unfertilized mouse eggs with extracellular ice formation in glycerolated modified Locke's solution at -10 °C. for periods up to 3½ hours. Survival was evaluated by development after transplantation into foster mothers.

Pezzoli, G. (1957). La torsione del testicolo. **[Torsion of the testicle in racehorses.]**—*Clin. vet., Milano* **80,** 353-364. [In Italian. Summary in English.] **882**

P. described 3 cases.—R.M.

Arthur, G. H. (1958). **An analysis of the reproductive function of mares based on *post-mortem* examination.** — *Vet. Rec.* **70,** 682-686. **883**

Study of post-mortem specimens of the genital tract of 792 equine animals ranging from heavy draught mares to moorland ponies revealed that follicle development in the equine ovary is prolific. In those with small follicles, it was not possible to distinguish by palpation the anoestrous specimen from the dioestrous. Corpus luteum did not alter the shape of the ovary and would be detectable clinically only in the first few days of its existence. From its incidence, it appeared that there is little difference in activity between the two ovaries, that anything up to 63% of mares may have oestrus in the winter months, and that twin ovulation is frequent. Evidence from the 6 pregnant mares suggested that resorption of one foetus very often occurs. Uterine abnormalities were found in only 8 specimens.—A. Ackroyd.

Lindley, C. E., Easley, G. T., Whatley, J. A., Jr. & Chambers, D. (1958). **A study of the reproductive performance of a pure-bred Hereford herd.**—*J. Anim. Sci.* **17,** 336-342. **884**

The herd's breeding performance 1935–52 included 3,606 pregnancies in 848 cows; most of the time calving occurred all through the year; management was considered good. Hand service alone was used till 1946, and then artificial insemination. [This may in large part account for the poor conception rates under range conditions.] The average number of services per conception, overall 1·7, increased from 1·4 in 1935 to 2·0 in 1951. The average calving to service interval was 76 days, the fewest services per conception (1.33) were required for those cows not served till 90 days or more post-partum. 3·2% of cows were culled as barren after an average of 8·8 services. Average productive life of a cow was approx. 5 years. After the 10th year of age, performance fell rapidly. [Calving age of heifers is not given.]—F. L. M. Dawson.

Blair, G. W. Scott. (1958). **Crystallization patterns of NaCl in bovine cervical mucus.**—*Proc. Soc. Stud. Fertil.* **9,** 99-104. **885**

This is a digest of an earlier paper [*V.B.* **28,**

271]. The attempts since made to improve the accuracy of the direct Papanicolaou type smear test by water dilution have so far resulted in no improvement, but the cow population used was not judged to be thoroughly suitable.

—F. L. M. Dawson.

Johnson, K. R., Ross, R. H. & Fourt, D. L. (1958). **Effect of progesterone administration on reproductive efficiency.**—*J. Anim. Sci.* **17,** 386-390. **886**

Of 139 "normal" Jersey and Friesian heifers and cows 69 were controls; 53 were treated with progesterone 100 mg. intramuscularly on second, third, fourth, sixth and ninth days after insemination; 17 received 500 mg. of the long-acting caproate progesterone preparation "Delalutin" on the second day after insemination. The treated groups had a conception rate to first insemination of 67·9 and 76·5% respectively (mean 72·2%), and all except 4 of these 70 conceived to the first or second service.

The controls had a conception rate to first insemination of 42% and 14 required more than two services. The difference between the groups was statistically significant. [The authors admit that control fertility was below the general average.]—F. L. M. Dawson.

Hill, H. J. & Pierson, R. E. (1958). **Repositol diethylstilbestrol as an abortifacient in feedlot heifers.**—*J. Amer. vet. med. Ass.* **132,** 507-512. **887**

In 29 "feedlots", 761 of 2,760 Hereford heifers were found by rectal examination to be pregnant and therefore of less value. Each was injected i/m with "Repositol" diethylstilboestrol. Approx. 80% of those pregnant less than 150 days aborted after one injection of 100 mg.; 89% of those pregnant 120—210 days aborted after 150 mg.; in those pregnant more than 210 days the abortion rate was 58%. Increased dosage did not increase the percentages of abortions. Approx. 50% of those which did not abort after the first treatment, aborted after a second treatment 3 weeks later. Complications were infrequent but retained placenta occurred in 7·5%, septic metritis in 1·9%, and vaginal prolapse in 1·4%. Heifers that aborted gained weight as well as, or better than, non-pregnant non-treated heifers on a similar diet.

—A. Ackroyd.

Emmens, C. W. & Cox, R. I. (1958). **Dimethylstilboestrol as an oestrogen inhibitor.** — *J. Endocrin.* **17,** 265-271. [Authors' summary modified.] **888**

Dimethylstilboestrol, a pro-oestrogen, inhibits the response to oestrone, oestradiol or diethylstilboestrol when both are given intravaginally to spayed mice by a 2-injection technique. It inhibits the natural oestrogens in doses of 0·05–0·5% of its own median effective dose about 50 μg.), but 5% of the median effective dose is needed with diethylstilboestrol.

No inhibition was seen in the present tests when either oestradiol (used in most tests) or inhibitor was given subcutaneously, or when both were given. Little or no inhibition was seen when oestradiol and inhibitor were given other than simultaneously.

It is suggested that the untransformed molecule is the active inhibitor.

Harrop, A. E. (1958). **An attempt to detect demonstrable oestrogen in the blood of the pregnant bitch.** — *Brit. vet. J.* **114,** 236-237. **889**

Pregnancy could not be confirmed in 31 bitches at various known stages by injecting their serum into oophorectomized mice and examining vaginal smears. Oestrogen if present at all could not be demonstrated in their blood by this technique.—A. Ackroyd.

Sacchi, E. M., Smith, E. B. & Tower, J. H. (1958). **Low-level antibiotic douches in bovine repeat breeders.** In *"Antibiotics Annual"* 1957-58. pp. 268-271. [New York: Medical Encyclopedia Inc.] **890**

219 "clinically normal" cows, distributed among four eastern and mid-western States, still not in calf after a mean of over 3 services each, were irrigated at insemination time, or 24–72 hours later, with 10 ml. oxytetracycline (terramycin) solution containing equivalent 100 mg. bioactivity. Conception rates of about 70% to first insemination resulted and most of the remainder were settled at a second insemination. 67 untreated controls were kept in 2 of the States concerned; these required about twice as many inseminations. The "simultaneous" treatment appeared less satisfactory than that given 24–72 hours after insemination.—F. L. M. Dawson.

Dawson, F. L. M. (1958). **Permanent infertility in dairy cows.** — *Agric. Rev., Lond.* **3,** 20-28. **891**

D. examined clinically and pathologically 252 cows of different breeds from 97 farms, which were discarded as being barren. More than a fifth were discarded after a single lactation: these cows calved at the early average age of 25 months and their average milk yield was nearly 10% above the breed average. The

largest group discarded were those which had failed to conceive at six successive oestrus periods. Treatment for infertility had been applied in less than half of the cases; in many untreated cases treatment would have yielded economically justifiable results.—R.M.

CHRISTIANSEN, W. M. (1958). Superovulation efter anvendelse af gonadotrope hormoner til sterilitetsbehandling. (Foreløbig meddelelse.) [**Superovulation after use of gonadotrophic hormones for treatment of sterility. (Preliminary communication.)**]—*Medlemsbl. danske Dyrlaegeforen.* **41**, 399-404. [In Danish.] **892**

Of 83 cows treated with pregnant mare's serum (P.M.S.) or P.M.S. plus chorionic gonadotrophin (P.U.), 21 gave birth to more than one calf (including triple and quadruple births). Among those treated with P.U. alone no increase in twinning was observed nor were there any triple or quadruple births. The same was true for cows treated with P.M.S. or P.M.S. plus P.U. which did not become pregnant within a normal oestrus. If, however, fertilization occurs within an interval of three weeks there is considerable risk of pregnancy with two or more foetuses.—F.E.W.

DAWSON, F. L. M. (1958). **Stillbirths in cattle.**—*Vet. Rec.* **70**, 672-673. **893**

In only one of the 6 stillbirth outbreaks in dairy cattle investigated so far in 1958 at the Veterinary Investigation Centre, Cambridge, have features of hypothyroidism been evident. In the rest, all of which were in Jerseys or Guernseys, hyperthyroidism was observed and features suggestive of Macdonald's experimental syndrome of retained placenta and shortened gestation brought about by progesterone deficiency in the last month of pregnancy were apparent. Prophylaxis against stillbirths in hypothyroid herds seems to demand supplementation with thyroid extract and iodine, whilst in hyperthyroid herds it may be economical to treat with progesterone.—A. ACKROYD.

SILLER, W. G. (1958). **Ventricular septal defects in the fowl.**—*J. Path. Bact.* **76**, 431-440. [Author's summary modified.] **894**

288 cases of ventricular septal defect, generally without clinical symptoms, were found in fowls during a period of five months. A genetic aetiology is suggested, in that 97% of these were in birds from three inbred lines. There was evidence of anatomical communication between left and right ventricles in a high proportion of cases, but functional valves had developed in many defects, and prevented any significant shunt. It is almost certain that septal defects in birds often close later in life.

NESTEL, B. L. (1958). **Bovine congenital porphyria (pink tooth), with a note on five cases observed in Jamaica.**—*Cornell Vet.* **48**, 430-439. [Author's summary modified.] **895**

N. discussed the literature on congenital porphyria in cattle. To the 30-odd observed living cases he added another five — three of these in Jamaica Red, and two in Jamaica Black cattle. The clinical picture was not consistent, and skin lesions were a marked feature in only one case. It was not possible to study the genetics of this series, but the Red and Black calves may have been closely related to each other.

ANDERSEN, A. C. & SCHULTZ, F. T. (1958). **Inherited (congenital) cataract in the dog.**—*Amer. J. Path.* **34**, 965-975. [Authors' summary modified.] **896**

One male among 1,129 beagles reared under identical conditions showed developmental cataract. This dog had impaired vision and developed complete bilateral cataract at 5 months of age. Of 25 puppies sired by this dog, 22 had cataract in various stages of development. In the eyes of puppies with complete cataract the outstanding lesions were microphthalmia, retinal folds, and opacity of the lens. Puppies with partial cataract had only slight microphthalmia and retinal folding. This form of cataract may best be explained as a defect in the development of the secondary lens fibres apparently resulting from incomplete continuity of the crystalline lens. Organs and skulls from all puppies were examined: ocular defects were the only lesions found.

BRUCE, H. M. (1958). **Genetic infertility in ruby-eyed male hamsters.**—*Proc. Soc. Stud. Fertil.* **9**, 90-98. **897**

17 males representing the ruby-eyed mutation were given every opportunity to mate with normal females; results were controlled by 9 normal (black-eyed) males. In the test group, fertility was fair to good up to 90 days of age; from 90–150 days of age it fell off progressively, though for a period sex drive remained unaffected. After about the 200th day libido failed also.

Histological findings indicated that testicular degeneration is progressive, spermatocytes and spermatids are not produced though spermatogonia persist. This may be proved to

be associated with pituitary insufficiency by experiments now continuing. [The sequence of events strikingly recalls that associated with "spermatic granuloma" in goats and bulls, which is due to congenital malformation of the vasa efferentia. Abstractor.]

—F. L. M. Dawson.

See also absts. **671** (dermal mycosis in an aborted calf); **715** (electron microscopy of equine abortion virus); **724** (abortion in sheep by virus of psittacosis-lymphogranuloma group); **785** (venereal sarcoma in dogs); **812** (ovine pregnancy toxaemia); **834** (foetal death in pigs); **851-852** (ability of foetal & new-born animals to withstand anoxia); **864** (lactate and pyruvate metabolism in foetal sheep); **900-901** (sexual maturity in fowls); **912** (book, physiopathology of reproduction & artificial insemination).

ZOOTECHNY

Biggers, J. D., McLaren, A. & Michie, D. (1958). **Variance control in the animal house.** —*Nature, Lond.* **182,** 77-80. **898**

Methods of controlling the overall variance of populations of laboratory animals are of importance.

The variation of a group of animals in respect of any character depends upon: (1) genetic factors, (2) environmental factors with persistent effects and (3) environmental factors with transient effects. In each of these categories the factors which increase the variance by varying from one animal to another should be distinguished from those factors which act uniformly throughout the group but affect the degree to which the animals are influenced by other factors which do vary. Hitherto, attention has been focused on the varying factors; the authors deal with the role of uniform factors in controlling variability.

The idea that very uniform animals could be obtained by inbreeding ignores the possible effects of uniform genetic factors on phenotypic variability. An inbred strain may be more variable than the F1 hybrid generation between two inbred strains. It seems that no purely genetical device for suppressing variability has yet been found to equal the "screening" of the F1 hybrids of a number of strain combinations, or even the screening of random-bred closed colonies, in order to find a combination, or colony, with a low variance in respect of the character which is to be studied.

Environmental factors with persistent effects must be optimal for the species, because sub-optimal conditions may cause increased variability.

Environmental factors with transient effects, such as changing of cages, size of cage, number of animals per cage, can modify the variance of response.

The authors conclude that in general, the conditions which minimize variance seem to be those which promote the general vigour of the colony, whether genetic or environmental, but that there is no real substitute for trial and error.—E.V.L.

Coop, I. E. & Clark, V. R. (1958). **The effect of thyroxine on wool growth and lamb production.** — *N. Z. J. agric. Res.* **1,** 365-381. [Authors' summary modified.] **899**

During 1954-57 some 650 Corriedale sheep were implanted with 1-thyroxine. The rate of wool growth was stimulated only by implants made during late summer and autumn. Optimum dose appeared to be in the region of 60-90 mg. as a single implant in sheep of 120-130 lb. body wt. 90 mg. implanted at the optimum time yielded on average a fleece wt. increase of 0·6 lb. (or 6%), mainly due to additional staple length. Fleece grade was not significantly improved, but the percentage of cotted fleeces was reduced. Implants of 90 mg. caused a loss of 8 lb. body wt., slowly and only partially regained in subsequent months. Late-summer implants made before mating for maximum wool response caused a slight increase in barrenness and decrease in twinning. The practical implications were discussed briefly.

Morris, T. R. & Fox, S. (1958). **Light and sexual maturity in the domestic fowl.** — *Nature, Lond.* **181,** 1453-1454. **900**

Pullets were hatched and 64 were reared each week for 20 successive months. At 16 weeks old survivors were divided into 2 groups; one receiving daylight only and the other artificial light to maintain a 14-hour day. When they reached the age of 30 weeks three out of four hatches were discarded. Sexual maturity, as judged by the laying of the first egg, was advanced slightly by the artificial lighting but this did not eliminate the normal seasonal variations. In both groups the onset of sexual maturity was earliest in those hatched in December and latest in those hatched in June.

—E. J. Castle.

Carson, J. R., Junnila, W. A. & Bacon, B. F. (1958). **Sexual maturity and productivity in the chicken as affected by the quality of illumination during the growing period.**—*Poult. Sci.* **37,** 102-112. **901**

September-hatched chicks at 10½ weeks of

age were put into 16 pens of identical design. One group received daylight only, a second group was illuminated continuously by standard 60-watt lamps in addition to daylight. A third group was given this continuous normal illumination from 60-watt lamps and daylight until 15 weeks of age and was then subdivided and illuminated with various coloured lights. Continuous illumination of pullets did not produce any harmful effects on livability and any quality of light stimulated the onset of egg production; all lighted pullets reached 50% production at least 3 weeks before the unlighted controls. Of the males, all lighted groups were producing significantly greater amounts of spermatozoa when the pullets began to lay than were the unlighted controls, but red and gold illumination appreciably suppressed subsequent spermatozoa production as compared with the normal lighting from 60-watt lamps used on the controls.—E.V.L.

See also abst. **907** (report, Agricultural Research Council).

TECHNIQUE AND APPARATUS

PANKRATOV, L. D. (1957). **[Use of proteolytic enzymes from fungi in preparing culture media.]** — *Trud. nauchno-kontrol. Inst. vet. Preparatov* **7**, 290-303. [In Russian.] **902**

Proteolytic enzymes from *Aspergillus terricola* and *A. terreus* were isolated and used for hydrolysing meat protein. Culture media prepared in this way were used for the production of blackleg and anthrax vaccines, brucella lysate and brucella antigen. The media were simple and easy to prepare and led to more economical utilization of meat.—R.M.

HAMMOND, E. C. (1958). **Ammonium alginate wool as a filter for collecting micro-organisms from large volumes of air.**—*J. gen. Microbiol.* **19**, 267-270. [Author's summary.] **903**

Ammonium alginate wool has proved to be a suitable collecting filter for estimating a small number of micro-organisms in a large volume of air.

LIEBERMAN, I. & OVE, P. (1958). **A protein growth factor for mammalian cells in culture.** — *J. biol. Chem.* **233**, 637-642. [Authors' summary modified.] **904**

A protein growth factor for certain human cells in culture has been purified about fortyfold from bovine serum. The assay used to follow the purification depends upon two marked effects of the growth factor: it causes adherence of the cells to a glass surface, and only in its presence do cells assume a flattened, epithelial-like shape.

Human serum and the serum of various other animals were also active. In sera from hospital patients no useful correlation was found between the level of activity and a specific disease condition.

For cell multiplication, in addition to the protein factor and albumin, serum provides one or more unidentified heat-stable, dialysable compounds.

A possible mechanism of action of the protein factor is discussed.

PUMPER, R. W. (1958). **Adaptation of tissue culture cells to a serum-free medium.** — *Science* **128**, 363. **905**

Cells from mouse lung became adapted to grow in a bacteriological peptone medium with glucose and penicillin added. Attempts to adapt human liver and HeLa cells to this medium failed.—R.M.

WILDY, P. & STOKER, M. (1958). **Multiplication of solitary HeLa cells.**—*Nature, Lond.* **181**, 1407-1408. **906**

Petri dishes, 60 mm. in diameter, were filled with about 30 ml. liquid paraffin, ten droplets of medium were then disposed under the oil on the bottom of each dish and a pool of about 100 cells was put in its centre. Under direct microscope vision, single cells were picked up with a very fine Pasteur pipette and placed in one of the drops of medium. The Petri dishes were then incubated at 37°C. in an atmosphere containing 6% CO_2 and with high relative humidity. Of 60 droplets, 20 grew colonies which could be transferred to tubes: the method was suitable for obtaining clones of HeLa cells and had the advantages of ensuring that each colony began as a single cell and that there was no possibility of a clone being contaminated by wandering cells.—E.V.L.

See also absts. **614-615** (tubercle bacilli); **620** (production of diphtheria toxin); **627** (selective media for Pasteurella species); **631** (cultivation of S. typhi-suis from porcine faeces); **632** (isolation of Br. abortus from bovine blood); **634-635** (cultivation of brucella).

REPORTS

GREAT BRITAIN. (1958). **Report of the Agricultural Research Council for the year 1956-57.** pp. 152. London: H.M. Stat. Off. 7s. [Cmd. 432.] **907**

The A. R. C. Field Station at Compton, the first research centre to be established under the direct control of the Council, was set up in 1938 primarily for the purpose of intensifying research into diseases of animals.

In developing the Station the policy has been to breed and rear a disease-free supply of farm animals of known health history and to provide accommodation to house the experimental animals in strict isolation. The Station provides facilities on a scale unmatched elsewhere. It occupies 2,000 acres of land and there are 1,100 dairy cattle, 2,500 sheep 1,200 pigs, 330 goats, 2,000 poultry and 20,000 small animals. There is a Central Laboratory, 3 dairy farms producing normal animals and milk, a pig farm, a poultry farm and a sheep flock, and also buildings designed to accommodate in isolation 588 adult cattle or larger numbers of smaller animals or poultry .

Diseases being investigated included brucellosis, vibriosis, mastitis in cows and Johne's disease in cattle, scrapie disease of sheep and pneumonia in pigs.

Other investigations included antibiotics in diets; a project aimed at the gradual elimination of horns in the Station's Ayrshire cattle to establish a Polled Ayrshire breed; blood grouping in cattle; haematology; disease in wild life; radiobiology; animal ecology.

The Foot and Mouth Disease Research Institute (Animal virus diseases), Pirbright, Surrey. Current work included:— Epidemiological surveys and immunological typing of virus strains; genetic and antigenic analysis; tissue culture; pathology and experimental cytology; vaccines and vaccinations—The urgent aim is stated to be more effective control.

Animal Diseases Research Association, Moredun Institute, Edinburgh. Current work was on Johne's disease of cattle and sheep and the diseases scrapie, virus abortion, pneumonia and tick-borne infections.

Animal Physiology and Nutrition research is dealt with by the **Rowett Institute,** Bucksburn, Aberdeenshire. This Institute was established in 1914 for research in animal nutrition.

The A.R.C. Institute of Animal Physiology at Babraham, Cambridge, was established in 1948 to extend knowledge of the fundamental physiology of farm animals.

A.R.C. Unit of Embryology, Department of Zoology, University College of N. Wales, Bangor, Caerns. Current work was on how the young animal derives its immunity to disease from the mother. Antibodies produced by the mother are transmitted to the young animal either before or after birth or both. They belong to the β-globulin fraction of the circulating serum proteins. Their transmission before birth, as in man, rabbit, g.pig, rat and mouse, involves transport of these large protein molecules across the foetal membranes without loss of their specific biological activity. Transmission after birth, as in the pig, horse, rat and mouse, involves secretion in the colostrum or milk and transport from the alimentary tract to the circulation of the unweaned young.

Researches are being extended. Labelled protein molecules are being used. Radioactive isotopes also provide a further means of marking molecules.

The A.R.C. Poultry Research Centre, Edinburgh, deals with research on genetics, physiology, nutrition, biochemistry, pathology, and behaviour.

The Houghton Poultry Research Station was established by the Animal Health Trust in 1948 and is now jointly financed by the Animal Health Trust and the Agricultural Research Council. Parasitological research in progress included isolation of pure lines of coccidial species from the fowl and the turkey, and a study of the nature of the immune response to coccidiosis by surgical techniques. Brief reference is made to other work in the sections Bacteriology, Pathology and Biochemistry, and Avian Reproduction. The work of the Station has been of great value and interest to the poultry farmers, particularly the means for dealing with many diseases by chemotherapy.—J. A. GRIFFITHS.

UNION OF SOUTH AFRICA. (1956). **City of Johannesburg. Annual Report of Director, Abattoir and Live Stock Market Department for the period 1st July 1955, to 30th June 1956.** [ROBINSON, M. C.] pp. 17. Johannesburg: H. W. Vorenberg & Co. (Pty.) Ltd. **908**

The staff consists of six veterinarians (two administrative, two executive and two seconded to the City Health Department for full time dairy inspection).

The total staff was 171 Europeans and 191 Africans.

Animals slaughtered were:— cattle 233,935;

calves 30,159; sheep 856,052; horses, mules and donkeys 12,491. The total (1,283,527) represents 37% of the total numbers slaughtered in the Union of South Africa. Importation of carcasses of beef from Bechuanaland was commenced during the year and only amounted to 18,433 carcasses.

The consumption of meat has declined since 1946 when it was 6·6 oz. a day for each person to 5·6 oz. each in 1954. The main causes of condemnation of meat were cysticercosis ("measles"); bruising; gangrene, pleurisy and peritonitis, pneumonia and pyaemia. Carcasses included in these groups were:— cattle 3,466; sheep and goats 1,423; veal 269; pork 3,027.

The incidence of cysticercus and echinococcus has declined in the ten years ending 1955 in bovines slaughtered, from 206 carcasses infected in 1945 to six in 1955, and in sheep from 11,162 to 6,396.

Dairy herds numbering 68,438 cattle in 989 herds were inspected by the Veterinary Staff.

Tuberculosis was diagnosed in 54 cattle and 268 pigs. Milk tests showed 0·5% TB. infected. Preventive inoculations included:— Anthrax 3,700; African Horsesickness 256; Contagious Abortion 481; Blackleg 600; Fowl Typhoid and Fowl Pox 5,775.

—J. A. Griffiths.

Nigeria. (1958). **Annual report on the Department of Veterinary Services of the Northern Region of Nigeria 1955-56.** pp. 26. Kaduna: Government Printer. 9d. **909**

Outbreaks of Rinderpest decreased by 15·35% as compared with the previous year. Although tax was paid for over 4,000,000 cattle in 1955–56 only 38,632 cattle were known to be infected with Rinderpest and these had a mortality of 10·9%;—'A remarkable success for the active immunisation policy carried out since the "twenties" '. The vaccine used in recent years is dried goat virus. About 13% of the total cattle are immunised each year. Breakdown of immunity is attributed to Coccidiosis in some provinces but this is to be investigated as soon as possible.

There were 64 outbreaks of Bovine Contagious Pleuropneumonia as compared with 206 outbreaks in 1953–54 and 157 in 1954–55.

Trypanosomiasis. 406,424 cattle were treated with ethidium bromide at a charge of 1/- per dose.

There were 76 outbreaks of Blackleg among 13,895 cattle (354 deaths). There were 11 outbreaks of Haemorrhagic Septicaemia (44 deaths). In 19,000 beef carcasses examined in Maiduguri there were only 13 cases of Tuberculosis. Brucellosis does not appear to be of any importance amongst nomadic Fulani cattle.

Foot and Mouth Disease occurs in a mild form among the nomadic herds, but has been noted among the trade cattle in a more severe form in which lameness occurs. An outbreak among 12,000 pigs occurred in a piggery near Kano adjacent to the trade cattle route. Lesions were very severe, in some cases hooves being lost. Mortality was 1%.

Rabies. 23 cases were confirmed in Kano, Plateau and Benue Provinces and human cases occurred with a history of canine contact in Sokoto and Zaria. Vaccination was not compulsory and was used for less than 700 dogs.

Helminth Infestation in goats and sheep is at its height during the rains. Haemonchus contortus and Trichostrongylus colubriformis are the worms most commonly found at P.M. examination. 82% of carcasses showed nodular disease lesions of the intestines. Drugs used in treatment were phenothiazine, hexachlorethane and to a lesser extent piperazine. 128,887 animals of all species were treated; sheep and goats (62,470), and cattle (56,328) made up most of the total.

In sheep and goats, in addition to helminths, Catarrhal Fever, Trypanosoma vivax infection and Caprine Contagious Pleuropneumonia caused many deaths in all provinces.

Theileria Infection was diagnosed in Bornu Province and Mange in goats was noted in Riverain Provinces. Tick control measures are not popular with Fulani.

There are sections on the animal industries; livestock slaughtered 786,448; export of untanned hides and skins (hides 941,472; sheep skins 930;000 goat skins 5,576,930); livestock improvement—details are given.

There is an interesting classification of Nigerian horses with plates showing specimens of the Dongola type from the Republic of the Sudan, the Arab-Barb from North Africa, and Pagan (Kirdi) ponies.—J. A. Griffiths.

BOOK REVIEWS

Kühn, A. (1959). Grundriss der allgemeinen Zoologie. **[Outline of general zoology.]** pp. vii + 289. Stuttgart: Georg Thieme. 13th edit. Revised & enlarged. DM 17.80. **910**

The fact that this is the third edition published within the last three years gives an idea of the popularity this work appears to enjoy among students in Germany. In the present

edition only minor revisions have been carried out. Paper, print and binding are of the usual high standard. [See also *V.B.* **20**, 3188 & **25**, 4213.]—E. G.

SILBERSIEPE, E. & BERGE, E. (1958). Lehrbuch der speziellen Chirurgie für Tierärzte und Studierende. [**Text-book of special surgery for veterinary surgeons.**] pp. xv + 596. Stuttgart: Ferdinand Enke. 13th revised Edit. DM 65. **911**

Sixty years have elapsed since the first edition of this book. Over these years it has kept its place as the standard German language work on special veterinary surgery, fulfilling the aim of its original author, Eugen Fröhner, namely to serve as a reference book for the practitioner and as a text-book for the student. Since the previous edition [*V.B.* **25**, 1236] 69 illustrations have been added, bringing the total to 625. Some passages have been revised, some newly added. The presentation leaves nothing to be desired.—E.G.

DERIVAUX, J. (1958). Physio-pathologie de la reproduction et insémination artificielle des animaux domestiques. [**Physio-pathology of reproduction and artificial insemination of domestic animals.**] pp. 467. Paris: Vigot Frères. **912**

This book is probably the first to be written specifically for clinicians with some bias towards specialization in this subject. The treatment thus requires to be more advanced than would be needed for the usual general text-book (of which a number have recently appeared), and the extent to which the author has succeeded in his object represents a remarkable achievement. (He is also actively engaged in teaching, and in the practice of obstetrics.)

The book has been built up from a study of some 900 references. Scrutiny of the list indicates that these have been carefully selected quite irrespective, for instance, of language, presumably from a much larger number of papers seen. Some of the papers listed were themselves published only a month before the book appeared.

Derivaux has maintained a high standard in composition, and the work is well balanced, highly informative, usually accurate and of use even to the whole-time specialist worker. The longest section of the book covers infertility; 50 pages are devoted to the male and 85 to the female, while the specific infections are dealt with in 44 further pages. The physiological section comprises 136 pages and that on artificial insemination some 83. The writing throughout is concise and concentrates on essentials, assuming considerable knowledge of fundamentals on the reader's part. All the usual species of domestic mammals are considered, and poultry are mentioned in certain connexions. Names of workers are frequently misspelt in the text and in the reference list. Derivaux omits mention of the classical work of Gullickson *et al.* in discussing the role of vitamin E in bovine metabolism; also of the possibilities of the basal body temperature and Papanicolaou tests in evaluating ovarian function. Inclusion of these would have notably strengthened weak arguments, and might have stimulated further clinical research.

—F. L. M. DAWSON.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

BAIER, W. & SCHAETZ, P. (1958). Tierärztliche Geburtskunde. [**Veterinary obstetrics.**] pp. viii + 316. Stuttgart: Ferdinand Enke. 3rd edit. DM 49.

EIBL, K. (1959). Lehrbuch der Rinderbesamung. [**Textbook of artificial insemination of cattle.**] pp. xv + 485. Berlin (& Hamburg): Paul Parey. DM 74.

SCOTT, J. P. (1958). **Animal behaviour.** pp. xi + 281. Chicago: University Press (London: Cambridge University Press.) 37s. 6d.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.

CONTENTS

	Page
Diseases caused by Bacteria and Fungi	163
Diseases caused by Protozoan Parasites	181
Diseases caused by Viruses and Rickettsia	183
Immunity	191
Parasites in Relation to Disease [Arthropods]	193
Parasites in Relation to Disease [Helminths]	194
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis]	196
Nutritional and Metabolic Disorders	199
Diseases, General	203
Poisons and Poisoning	208
Pharmacology and General Therapeutics	210
Physiology, Anatomy and Biochemistry	211
Public Health, Veterinary Services and Veterinary Education	215
Reproduction and Reproductive Disorders	215
Zootechny	217
Technique and Apparatus	218
Reports	219
Book Reviews	220
Books Received	224

INDEX TO AUTHORS

Aanes, W. A., 1196.
Abel, R., 914.
Abernathy, R. S., 995.
Adamič, S., 1201.
Aggarwala, A. C., 1230.
Akkermans, J. P. W. M., 1009, 1148.
Albrecht, A. D., 1130.
Allbrook, D. B., 1216.
Alvarez, E., 954.
Anderson, J. R., 1158.
Andrewes, C. H., 1093.
Angeloff, S., 1039.
Annison, E. F., 1225.
Apter, J. T., 1211.
Armstrong, D. T., 1250.
Arsen'eva, M. A., 1182.
Ashton, G. C., 1098.
Azarnoff, D. L., 1238.

Baier, W., 1272.
Bailey, J. W., 1253.
Baldelli, B., 1055.
Barlow, R. M., 1145.
Barnes, L. L., 1133.
Barret, J., 970.
Barron, D. H., 1223.
Baumgarte, G., 1011.
Bay, R. C., 1068.
Beamer, P. D., 1130.
Beard, D., 1087.
Beard, J. W., 1087.
Beaudette, F. R., 1267.
Beer, J., 1092.
Belonje, C. W. A., 1069.
Benedict, A. A., 1088.
Benerji, T. P., 946.
Berberović, M., 1095.
Berg, O. A., 939.
Bernhard, W., 1138.
Bessarabov, B. F., 968.
Bethell, F. H., 1231.
Bielschowsky, F., 1134.
Bizin, E. A., 986.
Björklund, N. -E., 1176.
Bocharov, M. S., 1182.
Bögrün, Ö., 1025.
Boko, F., 1115.
Booth, N. H., 1232.
Borisovich, Y. F., 928.
Borts, I. H., 998.
Bost, J., 1262.
Bouckaert, J. H., 1252.
Boulanger, P., 984.
Bouton, P., 970.
Boyland, E., 1136.
Bracken, F. K., 1000.
Bradley, G. M., 995.
Bray, R. S., 1266.
Brazier, M. A. B., page 224.
Breen, H., 1038.
Brenon, H. C., 1226.
Breuer, G. H., 1254.
Brion, A., 1269.
Brobst, D., 974.
Brown, C. E., 1133.
Brown, F., 1041.
Buchanan, W. W., 1158.
Bühner, F., 1102.
von Bülow, V., 1113.
Bull, L. B., 1162.
Burgisser, H., 1132.
Burmester, B. R., 1139.

Calaprice, A., 956.
Campbell, C. L., 1072.
Cancel B., 1195.
Caputto, R., 1155.
Carpenter, M. P., 1155.
Cartwright, G. E., 1147.
Casati, R., 936.
Catcott, E. J., 1198.
Chandrasekariah, P., 959.
Chandrasekharan Nair, K.P., 1022.
Chang, T. S., 1099.
Cheng Yuin-shian, 1054.
Cherkasova, A. V., 1174.
Chernigov, V. D., 988.
Chernysheva, M. I., 996.
Christoph, H.-J., 1228.
Ciaccio, G., 1090.
Cilli, V., 1055.
Cole, H. H., 1141.
Collier, H. O. J., 945.
Colvin, H. W., Jr., 1141.
Combs, G. F., 1143.
Coyle, T. J., 1111.
Cristophorov, L., 1047.
Cromartie, W. J., 921.
Cuba-Caparó, A., 1128.
Cuboni, E., 1247.
Cummings, J. N., 1224.
Cupps, P. T., 1141.
Cury, R., 976, 977, 978.
Cvjetanović, V., 1095.

Dafaalla, E. N., 982.
Dalton, P. J., 1137, 1208.
Daneš, L., 1057.
Dardiri, A. H., 1067.
Das, M. S., 916.
Datta, S., 1264.
Davidson, W. M., 1151.
Davis, D. E., 1116.
Dekker, N. D. M., 1126.
Delić, S., 1107, 1124, 1125.
Demidova, N. V., 1117, 1118.
Dempsey, H., 1147.
Dennig, H. K., 1050.
Denton, D. A., 1219.
Derbyshire, J. B., 913.
Deshpande, B. R., 1146.
Deshpande, S. P., 1146.
Dessau, F. I., 1200.
Dhanda, M. R., 946, 959, 1044, 1062.
Dhillon, H. S., 1044.
Dorsman, W., 1112.
van Dorssen, C. A., 920.
van Drimmelen, G. C., 993.
Duckworth, R. B., 1187.
Durand, M., 1173.
Duran-Reynals, 1128.

Eden, W. G., 1105.
Edeson, J. F. B., 1122.
Edwards, H. M., Jr., 1149.
Eichler, W., 958.
Eismont, V. V., 1020.
Embrey, M. P., 1213.
Emro, J., 1103.
Entwistle, J., 1103.
Evans, J. V., 1229.
Evdokimov, P. D., 1204.
Euzéby, J., 1268.

Falchetti, M., 1052.
Farrell, R. K., 955.
Felgner, K., 1233.
Fernandez-Cano, L., 1245, 1246.
Fey, H., 961.
Filseth, O., 1028.
Finkel, M. P., 1188.
Finkler, A. E., 1242.
Finland, M., 1210.
Flatt, W. P., 1140.
Florent, A., 1013.
Flüge, A., 990.
Flynn, A. D., 1105.
Fontanelli, E., 957.
Fontes, A. K., 1139.
Forbes, M., 1143.
Forman, S. A., 1151.
Foršek, Z., 931.
Forsyth, D. M., 1206.
Foster, N. M., 1068.
Fourt, D. L., 1253.
Furrer, W., 922.

Gaidukov, A. K., 1034.
Galaboff, S., 1039.
Gangulee, P. C., 946.
Garrett, W. J., 1213.
Gaspardis, D., 999.
Gavrilov, A. I., 947.
Gazda, J., 1156.
Gebauer, O., page 224.
Geiger, W., 1042.
Geissler, A., 987.
Gervasini, C., 1170.
Gezon, H. M., 974.
Gibert, P., 1227.
Gigoff, A., 1039.
Gilbert, C. S., 1038.
Gilbert, Y., 1061, 1063.
Gillespie, J. H., 1066.
Gillespie, R. W. H., 1000.
Gillis, M. B., 1149.
Girard, G., 941.
Gitelson, S., 1157.
Glätttli, H., 1160.
Glukhov, A. S., 991.
González-Más, A., 1195.
Gopalakrishnan, V. R., 1044.
Gordon, I., 1251.
Gorham, J. R., 955.
Goroshko, I. N., 1181.
Goudie, R. B., 1158.
Goulard, G., 1049.
Grashuis, J., page 224.
Gray, F. V., 1142.
Gray, K. G., 1158.
Green, D. M., 926.
Green, H. N., 1135.
Greenberg, J., 974.
Greer, W. E., 1018.
Grekova, N. A., 994.
Grimshaw, J. J., 945.
Grinitsuina, G. A., 949.
Grumbach, F., 941.
Guénev, C., 1047.
Guérin, M., 1138.

Habermann, R. T., 1179.
Hafez, E. S. E., 1244.
Hâkioglu, F., 1025.
Hall, W. H., 940.
Hall, W. J., 953.
Hall, W. T. K., 960.
Hansel, W., 1250.
Hansson, C.-H., 1263.
Harbourne, J. F., 973.
Hardenbrook, H. J., 1239.
Hardwick, D. C., 1222.
Harker, J. E., 1214.
Harris, H., 1229.
Harrison, R. G., page 224.
Harthorn, A. M., 1216.
Hartwigk, H., 948, 1027.
Hawthorn, J., 1187.
Hayes, F. A., 1018.
Heddleston, K. L., 953.
Heilmeier, W., 1193.
Helmboldt, C., 1128.
Henderson, B. W., Jr., 1067.
Herbrych, K., 1156.
Hessen, L., 951.
Hewitt, R., 1103.
Hidiroglou, M., 1058.
Hiepe, T., 1228.
Hoare, C. A., 1029.
Hoffman, R. G., 942.
Holgate, W., 1189.
Holmes, J. R., 1161.
Holub, M., 1097.
Horning, E. S., 1134.
Hornová, O., 1156.
Hubrig, T., 935.
Hunter, A. G., 1067.
Huysman, A., 1013.

Irskaya, E. M., 1237.
Iskandaryan, S. A., 1026.

Jakway, J. S., 1255.
Jamieson, W. M., 926.
Jeleff, W., 1002.
Jellinek, S., 1183.
Jennings, A. R., 1167.
Jensen, P. T., 966.
Jensen, R., 1152.
Jessen-Klingenberg, H. P., 1194.
Johnson, B. H., 922.
Johnson, K. R., 1253.
Johnson, R. H., 965.
Jones, R. K., 1001.
Jovov, K., 1124, 1125.
Joyner, L. P., 1032.
Juhász, B., 1192.
Juško-Grundboeck, J., 1074.
Jungherr, E., 1128.

Kaikini, A. S., 1146.
Kaiser, I. H., 1224.
Karras, W., 1243.
Kastner, H. J., 937, 938.
Katic, D. V., 1008.
Katic, R. V., 1008.
Keller, R., 1094.
Kendrick, J. W., 1066.
Kenzy, S. G., 1000.
Keown, G. H., 1000.
Khan, A. Q., 982.
Kimerlingová, M., 1057.
Kissling, R. E., 1059.
Klein, S., 1200.
Knox, B., 1166.
Kobusiewicz, T., 1043.
Kolabskii, N. A., 1034.
Kolesov, S. G., 927, 928.
Kondyurin, N. G., 1020.
Konopel'ko, P. Y., 1129.
Koppang, N., 1028.
Koroleva, A. A., 1235.
Kotin, P., 1198.
Kovalenko, Y. R., 1101.
Kovalev, G. K., 1203.
Krinochkin, A. D., 969.
Krishna Rao, N. S., 924.
Krüger, W., 935.
Kumm, H., 1165.
Kuslys, A., 932.
Kuznetsova, G. M., 1109.

Laing, A. B. G., 1122.
Lake, P. E., 1241.
Lamb, R., 925.
Larsen, S., 1175.
Laughland, D. H., 1151.
Lautié, R., 1049.
Laws, L., 960.
Leader, R. W., 955.
Lecce, J. G., 1014.
Lee Pao-chi, 1054.
Leser, H. H., 1197.
Lewis, D., 1225.
Lichstein, H. C., 940.
Liess, B., 1011, 1015, 1016, 1017.
Lietsch, C.-D., 1011.
Linman, J. W., 1231.
Lin-Peng, C., 1064.
Linzell, J. L., 1222.
Lipchuck, L., 1200.
Lister, B. A. J., 1190.
Löliger, H.-C., 1180.
Long, M. J., 1231.
Loosli, J. K., 1140.
Lorber, M. G., 1106.
Lourens, D. C., 1202.
Luck, C. P., 1216.
Lukashov, I. I., 1048.
Lyon, R. H., 940.

McCammon, C. J., 1198.
McCay, C. M., 1133.
McCay, P. B., 1155.
McCrory, B. R., 1068.
McEntee, K., 1066.
McFarland, C., 1088.
Macpherson, J. W., 1240.
Mahou, R., 1063.
Maksic, D., 1130.
Malherbe, H., 1040.
Mandelli, G., 1170.
Månsson, I., 915.
Maral, R., 1090.
Mar'ich, L. N., 1184.
Mayr, H., 1178.
Menon, M. S., 1062.
Mérieux, C., 1053.
Mérieux, J., 1052.
Merle, A., 971.
Meyer, A., 985.
Meynell, E. W., 979.
Meynell, G. G., 979.
van Middlesworth, L., 1186.
Mikhailov, N. A., 928.
Milhade, J., 1164.
Mingle, C. K., 981.
Mirsky, I. A., 1157.
Mitscherlich, E., 1011, 1015, 1017.
Mohiyudeen, S., 924.
Mole, R. H., 1189.
Mornet, P., 1061, 1063.
Morris, M. P., 1195.
Moskowitz, M., 1260.
Moss, L. C., 1232.
Mozley, A., page 224.
Munday, V., 1040.
Muraschi, T. F., 1005.
Murphy, J. M., 918.
Muth, O. H., 1154.
Mutovin, V. I., 1209.

Nachkov, D., 1047.
Nalbandov, A. V., 1271.
Narasinga Rai, B., 1022.
Nefedova, R. S., 1220.
Neitz, W. O., 1169.
Němec, J., 1060.
Nikitina, V. S., 1048.
Nikoloff, P., 1039.
Noorlander, D. O., 917.
Nüssel, M., 1236.

Obel, N., 1263.
O'Grady, J., 1200.
Okazaki, W., 1000.
Oldfield, J. E., 1154.
O'Moore, L. B., 1144.
Onufriev, V. P., 1108.
Orduinskii, S. I., 1207.
Orlandella, V., 972.
Osipov, A. N., 1119.
Otte, B., 1042.
Ottosen, H. E., 983.

Pankavich, J., 1103.
Pantaleon, J., 970.
Paterson, A. B., 930.
Paulissen, L. J., 1100.
Pereira Rodríguez, R., 1023.
Petrović, Z., 1107.
Phillips, C. E., 1007.
Pier, A. C., 917.
Piercy, S. E., 1024.
Pieretti, R .V.. 1037.
Pierson, R. E., 1196.
Pietzsch, W., 1019.
Pilgrim, A. F., 1142.
Piliposyan, T. B., 1026.
Pinochet, L., 914.
Podkopaev, V. M., 962.
Popović-Sabo, M., 923.
Porporis, J., 970.
Porzecanski, B., 1051.
Pouska, F., 1060.
Prange, H., 1011.
Pratt, D. A. H., 1261.
Prevost, R., 1058.
Prokof'eva, M. I., 1181.
Pryer, D. L., 1213.
Purchit, M. S., 1234.
Purdom, M. R., 944.

Rafferty, K. A., Jr., 1128.
Rasbech, N. O., 1012.
Rastegaeva, A. M., 963, 964.
Read, C. P., 1116.
Reinders, J. S., 1065.
Remmert, L. F., 1154.
Renk, W., 919.
Rheins, M. S., 1099.
Ringen, L. M., 1000.
Rivoalen, A., 1164.
Robbins, J., 1096.
Roberson, B. S., 921.
Roemmele, O., 1191.
Rössger, M., 975.
Romić, S., 934.
Romić, Z., 931.
Van Rooyen, C., 1202.
Rosenberger, G., 1172.
Rosenfeld, G., 1185.
Ross, R. H., 1253.
Rott, R., 1091.
Rukavina, J., 1107, 1124.
Ryff, J. F., 1038.

Sadchikov, S. I., 1217.
Sahai, L., 1265.
Sakanyan, S. S., 1073.
Salton, M. R. J., 980.
Samorodov, N. M., 1174.
Sane, C. R., 1146.
Sankale, M., 1164.
Sauer, F., 1151.
Saurat, P., 1049.
Schaetz, F., 1272.
Schalm, C. W., 917.
Schamper, A., 1205.
Schechmeister, I. L., 1100.
Schels, H., 943.
Schenck, D. M., 1260.
Schiller, A. G., 1130.
Schindler, H., 1241.
Schindler, R., 1050.
Schliesser, T., 937.
Schoening, H. W., 1070.
Schubert, J. R., 1154.
Schütz, G., 967.
Schulze, W., 1228.
Schwab, J. H., 921.
Schwarz, H.-J., 992.
Scott, J. P., 1273.
Scott, J. V., 1239.
Seaman, A., 944.
Seelemann, M., 985.
Selivanov, A. V., 949.
Semenova, L. P., 1153.
Semenova, L. S., 1035.
Setnikar, I., 1223.
Shafa, F., 980.
Shevchenko, N .K., 1174.
Shill, O. S., Jr., 1004.
Shnel, K. N., 1168.
Shol'ts, S. V., 1256.
Shotts, E. B., 1018.
Simmons, G. C., 1003.
Singh, B., 1234.
Sinha, P. K., 1114.
Slen, S. B., 1218.
Slivko, V. V., 950.
Smirnov, S. M., 997.
Smith, A. N., 984.
Smith, G. R., 952.
Smithburn, K. C., 1056.
Smyth, P. J., 1144.
Sneath, H. A., 1093.
Sokoloff, L., 1179.
Soliman, K. N., 1033.
Soni, B. K., 1230.
Sovinová, O., 1060.
Spaulding, E. H., 1258.
Sperling, G., 1133.
Spink, W. W., 995.
Squeri, L., 972.
Srivastava, H. D., 1114.
Starkebaum, C. C., 1171.
Stepanova, E. N., 1221.
Stetson, C. A., Jr., 1096.
Stewart, R. B., 1089.
Stöber, M., 1172.
Stoufer, R. M., 1215.
Stoyanov, V., 1047.
Strauch, D., 1091.
Struk, V. M., 1257.
Stünzi, H., 961.
Sudarić, F., 1127.
Supplee, W. C., 1143.
Suter, E., 942.
Swenson, M. J., 1232.
Sykes, G., 1270.
Szegedi, B., 1192.

Tammemagi, L., 1003.
Terpstra, J. I., 1009, 1148.
Teute, H. W., 919.
Thamm, H., 1199.
Thorson, R., 1103.
Thurston, J. P., 1030.
Tinyakov, G. G., 1182.
Todd, A. C., 1120.
Tomová, B., 1060.
Trailov, Z., 1008.
Traub, E., 1046.
Trautwein, G., 1131.
Trilenko, P. A., 989.
Trofimov, V. P., 1021.
Troise, C., 976, 977, 978.
Tsalikis, J., 1200.
Tucker, E. M., 1222.
Tum-Suden, C., 1215.
Tunkl, B., 931.

Uçar, N., 933.
Udall, R. H., 1153.
Uhlmann, W., 1046.
Ullenberg, G., 1163.
Ullman, G. E., 942.
Vandeplassche, M., 1013, 1252.
Vaughan, J., 1189.
Velle, W., 1248, 1249.
Verge, J., 1049.
Vershilova, P. A., 994.
Victor, D. A., 1123.
Le Viguelloux, J., 1164.
Vincent, D. J., 1110.
van Vliet, N., page 224.
Vogelsang, E. G., 1037.

Waletzky, E., 1103.
Wallace, C. R., 1177.
Wallace, W., 1103.
Walter, W. G., 1139.
Warner, R. G., 1140.
Warren, F. L., 1229.
Watson, D., 1261.
van Waveren, H. G., 1009.
Wei, T., 1121.
Weibel, J. L., 1038.
Weighton, C., 1159.
Weil, A. J., 1242.
Weller, R. A., 1142.
Werfel, F., 1156.
Weyl, A., 1045.
Wharton, R. H., 1122.
Wichmann, R. W., 1110.
Wilcox, F. H., 1241.
Will, D. H., 1232.
Wilson, M. W., 1259.
Wilson, R., 1135.
Winter, A. R., 1099.
Wintrobe, M. M., 1147.
Wintzer, H. J., 1212.
Wohanka, K., 1010.
Wohllaib, R., 1031.
Woodbine, M., 944.
Wright, P. G., 1216.

Young, R. J., 1149.
Young, W. C., 1255.
Yuan Ching-tze, 1054.

Zebrowski, L., 1074.
Zipplies, G., 1006.
Zorabyan, L. I., 1026.
Zubrzycki, L., 1258.
Zwart, D., 1036.

Yang, P., 1121.

The Executive Council of the Commonwealth Agricultural Bureaux is a signatory to the Fair Copying Declaration, details of which can be obtained from the Royal Society, Burlington House, London, W.1.

ABBREVIATIONS OF NAMES OF PUBLICATIONS

The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years* 1900-1950, 3rd Edit. (1952), London : Butterworths Scientific Publications.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature are, however, included in *Index Veterinarius;* so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius,* where titles of all publications indexed by the bureau are fully cross-referenced.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

SOME RECENT PUBLICATIONS OF THE COMMONWEALTH BUREAU OF ANIMAL HEALTH

NEOPLASMS OF THE DOMESTICATED MAMMALS

by E. COTCHIN, M.R.C.V.S., *Royal Veterinary College, London*

Crown 4to stiff cover pp.xv + 100

A comprehensive review covering mainly the period from 1932 onwards.

950 references

Price 20s.

SALMONELLOSIS IN ANIMALS

by A. BUXTON, PhD., M.R.C.V.S., *Dept. Vety. Pathology, University of Liverpool*

Medium 8vo stiff cover pp.v + 209

A comprehensive review covering domestic animals, poultry, fur-bearing animals, rodents, reptiles and arthropods.

1,750 references

Price 25s.

VETERINARY REVIEWS AND ANNOTATIONS

A half-yearly review of topical subjects.

Annual Subscription 25s.

All the above obtainable from:—

Central Sales Branch, COMMONWEALTH AGRICULTURAL BUREAUX, Farnham Royal, Nr. Slough, Bucks, England.

Index Veterinarius

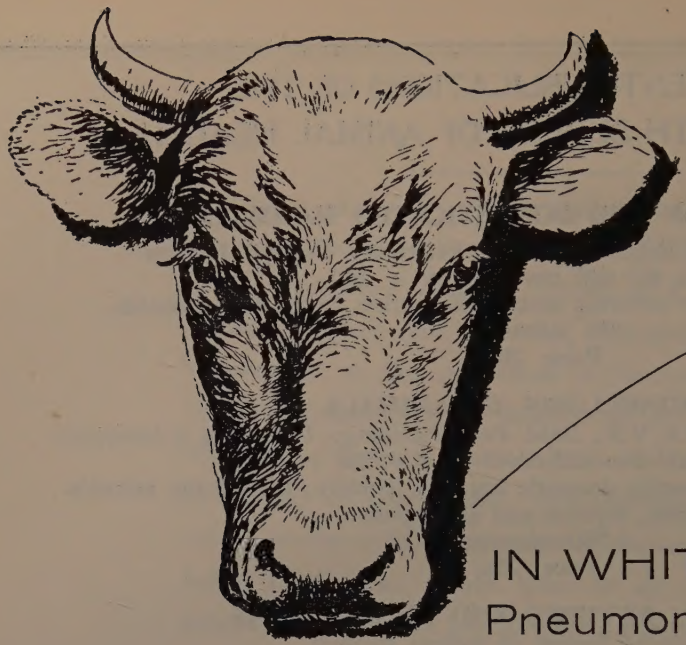
A COMPLETE BIBLIOGRAPHY OF VETERINARY LITERATURE

This subject and author index of current literature on veterinary and related sciences is produced by the Commonwealth Bureau of Animal Health and was first published in 1933. It is issued quarterly and each year about 10,000 references are listed. Arrangement of material is designed to facilitate rapid location of information.

For compilation of the *Index* nearly a thousand periodicals in 22 languages are searched and coverage embraces the whole world.

Annual subscription is £5 and orders may be sent to the Central Sales Branch, Commonwealth Agricultural Bureaux, Farnham Royal, Slough, Bucks.

Volumes 13—25 (1945-1957) are still available. Stocks of other volumes are incomplete. Details on request.



IN WHITE SCOURS
Pneumonia, Shipping Fever,
Enteritis, Metritis
and as a prophylactic after
parturition .....

The new tablet form of Chloromycetin for oral or intrauterine administration.

CHLOROMYCETIN* VETRETTES*

Administration: As a uterine pessary: Orally as a tablet or crushed in milk or water and used as a drench.

Box of 6 Vetrettes, each containing 500 mg. Chloromycetin.

CHLOROMYCETIN VETRETTES

*TRADE MARK

PARKE, DAVIS & COMPANY LTD. Inc. (U.S.A.),
HOUNSLOW, MIDDLESEX. Tel.: Hounslow 2361

W.P.S. 1036